The classification of Australian species currently included in *Helipterum* and related genera (Asteraceae: Gnaphalieae): Part 1

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Abstract

Wilson, Paul G. The classification of Australian species currently included in *Helipterum* and related genera (Asteraceae: Gnaphalieae): Part 1. Nuytsia 8(3): 379-438 (1992). The name *Helipterum* DC. is recognised as being illegitimate and not applicable to Australian taxa. The Australian species currently included in that genus and in the related genera *Cephalipterum*, *Gilberta*, *Triptilodiscus* and *Pterochaeta* are reclassified. One genus, *Haptotrichion*, is described as new. Under *Rhodanthe* 11 sections are recognised of which 1 is new and 10 are new combinations. Eight new species of *Rhodanthe* and one new species of *Haptotrichion* are described, these are *R. ascendens*, *R. collina*, *R. cremea*, *R. gossypina*, *R. nullarborensis*, *R. psammophila*, *R. rufescens*, *R. sphaerocephala* and *H. colwillii*. A number of new species combinations are made. Descriptions are given for each of the recognised genera and sections.

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Introduction

As has been pointed out by many syantherologists (Hilliard & Burtt 1981, Anderberg 1989, 1991, Wilson 1989a), the genera *Helipterum* Lindley (1836), *Helipterum* DC. (1838) and *Helichrysum* Miller, in the strict sense, do not occur in Australia and, in any event, the first name is illegitimate and is to be typified by a South African species currently placed in *Helichrysum* (Wilson 1989a), while the second is illegitimate and is to be typified by a South African species of *Syncarpha* DC. (Nordenstam 1989).

The difference between the genera *Helipterum* DC. and *Helichrysum*, as enunciated by A. de Candolle (1838), is that in *Helipterum* the pappus bristles are plumose whereas in *Helichrysum* they tend to be barbellate, or plumose only at the apex. A strict interpretation of this distinction can lead to a placement of related species into separate genera, although the distinction has meant that closely related species have usually been placed together in either *Helipterum* or in *Helichrysum*.

In order to classify the species currently included in *Helipterum* and *Helichrysum* it has been necessary to study related genera of the Gnaphalieae (*sensu* Anderberg 1989) such as *Leptorhynchus*, *Ixiolaena*, *Waitzia*, *Podolepis*, *Podotheca*, *Myriocephalus*, as well as several monotypic genera.

The revised classification has resulted in the recognition of additional genera and the rearrangement of the species currently in *Helipterum* and *Helichrysum*. Some of the resulting genera are being revised by other botanists whose work I do not wish to compromise by producing a comprehensive classification lacking in the information that they will be able to provide. Therefore in this paper I am formally treating a portion of the *Helipterum* complex while indicating the genera into which other species currently included in *Helipterum* are likely to be transferred.

The classification that follows for a portion of the *Helipterum* complex in Australia attempts to associate closely related species and to segregate as distinct genera those species or groups of species that exhibit marked morphological discontinuity. In *Rhodanthe* I have not been successful in interpreting the phylogenetic significance of the varied morphological forms that are adopted by homologous organs. In the achene, for example, the pericarp and testa can have many different textures and structures (Short *et al.* 1989), yet to generically separate taxa that have dissimilar achenes can lead to the separation of species which otherwise have markedly similar florets and similar bract morphologies. For this reason I have adopted a sectional rank for taxa that may later be shown to deserve generic rank and which were sometimes so accorded by early 19th century taxonomists.

I have not attempted to place all the genera of the 'Angiantheae' *sensu* Bentham (1867) in context with those of the *Helipterum* complex but it is obvious that a close relationship often exists. This type of synoptic work will have to be done by others; my principal concern is to provide a classification that can be used for a 'Flora of Australia' treatment and, from the pressure of time alone, many interesting phylogenetic avenues must remain unexplored.

This paper considers the *Rhodanthe*, *Hyalosperma* and *Triptilodiscus* groups of species, most of which have, in general, been placed in *Helipterum*. These groups can be informally categorized as follows.

***Rhodanthe* group**: Inner involucral bracts with broad flat claws; anthers with fine filamentous tails; achenes with normal (mostly not thickened) duplex hairs. Species in this group, with the exception of *Rhodanthe citrina*, that have been examined, do not form ectomycorrhiza (Warcup 1990).

***Hyalosperma* group**: As above, however, achenes lacking normal duplex hairs but with 2-celled bulbous papillae that are frequently myxogenic; pappus shed entire. Species in this group that have been examined form ectomycorrhiza (Warcup *op.cit.*)

***Triptilodiscus* group**: Species in this group have achenes with 2-celled tooth-like trichomes and oblong or boat-shaped claws to the involucral bracts. Other characters suggest that the included genera may not be closely related and that the group is polyphyletic; this therefore becomes a grouping of convenience. In only *Triptilodiscus* has the mycorrhizal association been investigated; it was found to form ectomycorrhiza (Warcup *op.cit.*).

The genus *Rhodanthe*, which is by far the largest of the segregate genera, is circumscribed to contain the majority of the Australian species previously included in *Helipterum*. Some of the remaining species are listed under other genera in this paper. Those species excluded from the present treatment are as follows:

Helipterum albicans (Cunn.) DC., *Helipterum fitgibbonii* F. Muell., *H. molle* (DC.) Paul G. Wilson, and *H. stipitatum* (F. Muell.) Benth. have been transferred to *Leucochrysum* (DC.) Paul G. Wilson, (see Wilson 1992a) a genus closely related to *Waitzia*.

Helipterum niveum Steetz is closely related to *Helichrysum obtusifolium* Sonder; both species will be segregated, with others, in a genus to be described.

Helipterum saxatile Paul G. Wilson is closely related to *Helichrysum podolepidium* F. Muell., these two species will, with others, be placed in a genus to be described.

Helipterum craspedioides is conspecific with *Myriocephalus morrisonianus* and is possibly best recognised as a member of the genus *Polycalymma* (but see Short *et al.* 1989 and Anderberg 1991).

Helipterum adpressum W. Fitzg. (= *Helichrysum puteale* S. Moore) and *Helipterum pterochaetum* (F. Muell.) Benth. have been transferred to the genus *Chrysocephalum* Walp. as *C. puteale* (S. Moore) Paul G. Wilson and *C. pterochaetum* F. Muell. (see Anderberg 1991 and Wilson, Short & Orchard 1992).

The species that are here placed in *Rhodanthe* form a polymorphic assemblage that is divided into eleven sections. Some of the sections that have obvious problems associated with them are briefly discussed below.

The sect. *Monencyanthes*, in which the achenes are persistent and the capitula caducous, contains three species. These species probably attained their specialised condition independently for each has features that suggest derivation from a different ancestor possibly of the *Achyroclinoides* type.

The species in sect. *Leiochrysum* are diverse in vegetative and floral morphology. The organs appear to vary in morphology independently from each other and I have been unable to correlate characters in a manner that would achieve a more natural classification.

The sect. *Helichrysoides* appears to be a monophyletic group which, at one extreme has affinity to the genus *Podotheca* and, at the other, to species in sect. *Leiochrysum*. Its correct taxonomic status is uncertain (see also Anderberg 1991).

Each of the sections *Anisolepis* (1 sp.), *Actinaria* (2 spp.), and *Helipteridium* (1 sp.), has very distinctive involucral bracts but each shows little difference in floral morphology to certain species in sect. *Achyroclinoides*; I have therefore included these sections in *Rhodanthe* rather than give them generic status.

The sect. *Citrinae*, with the single species *R. citrina*, has been difficult to place. Due to the beaked apex to its achene this species has been previously included in *Waitzia*. It differs radically from *Waitzia* in that the involucral bracts have flat claws with an undivided stereome (*fide* Anderberg 1991), the style apex is truncate, and the achenes pilose. It differs from other species of *Rhodanthe* in sometimes having the outer florets female (not hermaphrodite) and in being an ectomycorrhizal species (Warcup 1990). Both these characters suggest a relationship with species such as *Chrysocephalum apiculatum* (Labill.) Steetz and *Leucochrysum albicans* (Cunn.) Paul G. Wilson, but the morphology of the achenes and corollas of the three species is quite different. It possibly deserves recognition as a distinct genus.

Rhodanthe polyphyllum, which is placed in the monotypic section *Polyphyllum*, is a further anomaly since it has stout, branched anther tails and clustered, filiform leaves. It appears to have no close relative in the *Helipterum - Helichrysum* complex. Nevertheless I have included it in *Rhodanthe* with which it appears to have greatest affinity. Again, it may deserve recognition as a distinct genus.

Catalogue of taxa

In this Catalogue I have listed the accepted names and their synonyms in the *Rhodanthe*, *Hyalosperma* and *Triptilodiscus* groups. For new taxa and for all genera and sections I have provided descriptions. Where it has been necessary I have lectotypified names.

The Rhodanthe group

Rhodanthe Lindley

Rhodanthe Lindley, Bot. Reg. t.1703(1834).

Helichrysum sect. *Rhodanthe* (Lindley) Baillon, Hist. Pl. 8:314(1886). *Type: R. manglesii* Lindley

Roccardia Necker ex Voss, Vilm. Blumengärtn. ed.3, 1:530(1895) *nom. illeg. non* Necker ex Raf.(1838). *Type: R. manglesii* (Lindley) Voss [=*Rhodanthe manglesii* Lindley].

Annual or short-lived perennial herbs, woolly, puberulous, pilose, glandular, or glabrous. Leaves mostly alternate, simple, entire, rarely terete. Capitula homogamous or heterogamous, solitary or clustered, radiant or not; subtending leaves, when present, grading into the outer bracts. Involucral bracts multi-seriate, glumaceous or scarious, rarely with a herbaceous tip; claws oblong with narrow or broad undivided stereome (Anderberg 1991). Receptacle glabrous, or pilose around alveolae, predominantly ebracteate. Florets bisexual or the innermost male, otherwise homomorphic. Corolla tubular at base, usually turbinate above, glabrous or sparsely puberulous; lobes 5, equal or not, inner epidermis with cells not oblong in transverse rows. Anther tails filamentous and weak. Style apex truncate to ellipsoid or deltoid. Achene with normal duplex hairs; carpopodium annular or absent. Pappus bristles barbellate to plumose.

1. Rhodanthe Lindley sect. Rhodanthe

Annual erect herb, glabrous. Leaves cauline, sessile, suborbicular, base decurrent on each side of stem. Capitula heterogamous, solitary on slender branches. Involucre turbinate; bracts multi-seriate, papery, petaloid; claw with scarious margin and narrow-oblong thin stereome. Receptacle rounded, smooth, glabrous. Florets numerous, mainly bisexual but the innermost male, 5-merous. Corolla actinomorphic, glabrous; upper portion cup-shaped; lobes not papillose; veins extending into base of lobes. Stamens: anther appendage cordate, acute, the cells narrow-oblong towards apex, equilateral near base; anther tails filamentous, weak; collar narrow-oblong. Style apex narrow-deltoid, vascular trace not extending to tip. Achene obovoid, dorsiventrally compressed, densely silky to base; carpopodium absent; pericarp thin, translucent, in medial position in relation to the cotyledons; testa thin, translucent, ± fused to pericarp, the vascular strand extending almost completely around seed; crystals absent. Pappus persistent; bristles plumose, the cilia all acute.

A monotypic section that is most closely related to species in sect. *Leiochrysum*. It is distinctive in being glabrous, in having suborbicular sessile decurrent leaves, and possessing an anther appendage and a style apex that are unique in the genus.

Rhodanthe manglesii Lindley, Bot. Reg. 20: t.1703(1834). - *Helipterum manglesii* (Lindley) Benth., Fl. Austral. 3:640(1867). - *Helichrysum manglesii* (Lindley) Baillon, Hist. Pl. 8:314(1886). - *Argyrocome manglesii* (Lindley) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia manglesii* (Lindley) Voss, Vilm. Blumengärtn. 3rd edn, 1:531(1895). *Type:* Swan River Colony, *leg. J. Drummond, n.v.*

Rhodanthe atrosanguinea J. Drumm. ex hort., Gard. Chron. no. 27:622(1861). *Type:* Limestone Hills, Champion Bay, W.A., *J. Drummond, n.v.*

Rhodanthe manglesii var. *sanguinea* Hook., Bot. Mag. 87:t.5283(1861). - *Roccardia manglesii* f. *sanguinea* (Hook.) Voss, Vilm. Blumengärtn. 3rd edn, 1:531(1895). *Type:* Western Australia, *J. Drummond, n.v.*

Roccardia manglesii f. *ligulosa* Voss, Vilm. Blumengärtn. 3rd edn, 1:531(1895). *Type:* not indicated.

Helipterum cryptanthum O. Sarg., J. Bot. 61:285(1923). *Type:* Mt Brown, York, Western Australia, *O. Sargent* 1404 (holo: BM; ?iso: MEL 109635 *Sargent* 1404a).

2. Rhodanthe sect. **Monencyanthes** (A. Gray) Paul G. Wilson, comb. nov.

Monencyanthes A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:229(1852).

Helipterum sect. *Monencyanthes* (A. Gray) Benth., Fl. Austral. 3:648(1867). *Type: Monencyanthes gnaphalioides* (Hook.) A. Gray

Annual herbs, variably woolly. Leaves cauline, linear to narrow-oblong, entire. Capitula heterogamous, sessile or subsessile in terminal glomerules, caducous. Involucre ellipsoidal, narrow-cylindrical, or cup-shaped, not radiant; bracts scarious, woolly ciliate, the inner with linear hard claw. Receptacle insignificant or rounded, with or without receptacular bracts. Florets 1-c. 12, bisexual or male, 5-merous. Corolla actinomorphic, cylindrical or narrow-turbinate, glabrous. Stamens: anther appendage broad ovate, obtuse, the cells narrow-oblong, thin-walled; anther tails filamentous, weak. Style apex truncate, papillose. Achene ellipsoidal, c. 2.5 mm long, persistent on receptacle, sparsely short pilose; carpopodium absent; pericarp membranous, hyaline, and with crystals (*M. maryonii*) or outer layer with thickened brown radial walls and crystals absent, nerves medial or medial-oblique in relation to cotyledons (Short *et al.* 1989); testa membranous and fused to pericarp or somewhat leathery and free (*M. maryonii*), crystals present. Pappus persistent, the bristles plumose weak with a few long cilia.

Notes. This taxon was treated in a very broad sense as a section of *Helipterum* by Bentham (1867) so as to include some species now placed in *Chrysocephalum*, *Rhodanthe* sect. *Achyroclinoides*, and *Hyalosperma*. I have restricted it to those species with a woolly indumentum, and caducous capitula with persistent shortly hirsute achenes that have a persistent pappus. The included species, though superficially similar, probably arose independently from different species with caducous achenes since in the microscopic structure of the corolla each displays a significantly different morphology. It is interesting that in the achene of *R. maryonii* the pericarp bears crystals (presumably of calcium oxalate) whereas in all other species of *Rhodanthe* that have crystals in the achene they are found only

in the testa. Short *et al.* (1989) record that of the members of the Inuleae that they examined, crystals in the pericarp were only found in *Craspedia* aff. *pleioeephala.*

Rhodanthe moschata (Cunn. ex DC.) Paul G. Wilson, comb. nov.

Gnaphalium moschatum Cunn. ex DC., Prod. 6:236(1838). - *Helipterum mosehatum* (DC.) Benth., Fl. Austral. 3:648(1867). *Argyroeome moschata* (DC.) Kuntze, Revis. Gen. Pl. 1:309 (1891). *Type:* Molle's Plains, Lachlan River, Interior of New South Wales, 1817, *A. Cunningham* (holo: G-DC photo seen).

Calocephalus gnaphalioides Hook. in T. Mitch., J. Exped. Int. Trop. Austral. 378(1849). - *Moneneyanthes gnaphalioides* (Hook.) A. Gray, Hooker's J. Bot. Kew Gard. Misc. 6:230(1852). *Type: T.L. Mitchell, n.v.*

This species is often confused with *R. tietkensii* which may be distinguished by its more numerous florets (c. 10 to a head), and absence of prominent glandular hairs on the corolla lobes. In *R. moschata* there are c. 3 florets to a capitulum (1 or 2 bisexual) and prominent glands on the lobes.

A collection from the Simpson Desert, Northern Territory (*G. Chippendale,* NT 6577, herb. AD) appears to be a hybrid between *R. tietkensii* and *R. mosehata.* The herb. NT duplicate of this collection is of true *R. moschata. Rhodanthe tietkensii* has been found in the same area.

Material collected in northern Eyre Peninsula, South Australia, differs from the common variant in having milky white (not scarious) involucral bracts.

Rhodanthe uniflora (J. Black) Paul G. Wilson, comb. nov.

Helipterum uniflorum J. Black, Trans. & Proc. Roy. Soc. South Australia 41:651 t.43(1917). *Leetotype* (here chosen): Koppermanna, 7 Oct. 1916, *S.A. White* (AD 98625090 *p.p.*), isolecto: MEL 110472, NSW 181468.

Rhodanthe maryonii (S. Moore) Paul G. Wilson, comb. nov.

Helipterum maryonii S. Moore, J. Linn. Soc. Bot. 45:182(1920). *Type:* Mulline, *J.E.C. Maryon* (holo: BM; iso: MEL 110713, NSW 181424).

3. Rhodanthe sect. **Leiochrysum** (DC.) Paul G. Wilson, comb. nov.

Helipterum sect. *Leiochrysum* DC., Prod. 6:216(1838). *Lectotype* (here designated): *Helipterum polygalifolium* DC. [=*Rhodanthe polygalifolia* (DC.) Paul G. Wilson].

Helipterum sect. *Sericophorum* DC., Prod. 6:216(1838). *Lectotype* (here designated): *Helipterum humboldtianum* (Gaudich.) DC. [=*Rhodanthe humboldtiana* (Gaudich.) Paul G. Wilson].

Pteropogon DC., Prod. 6:245(1838). - *Pteropogon* sect. *Facelioides* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:267(1852) *nom. illeg.* - *Helipterum* sect. *Pteropogon* (DC.) Benth., Fl. Austral. 3:639(1867). *Type: P. pygmaeus* DC.

Xyridanthe Lindley, Sketch Veg. Swan Riv. Col. 23(1839). *Type: X. stricta* Lindley

Acroclinium A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:270(1852). - *Helichrysum* sect. *Acroclinium* (A.Gray) Baill., Hist. Pl. 8:174, 314(1882); F. Muell., Fragm. 3:32(1862) *nomen*. *Lectotype* (here designated): *A. multicaule* A. Gray [=*Rhodanthe chlorocephala* (Turcz.) Paul G. Wilson].

Griffithia J. Black, Trans. & Proc. Roy. Soc. South Australia 37:122(1913). *Type: G. helipteroides* J. Black [=*Rhodanthe oppositifolia* (S. Moore) Paul G. Wilson].

Annual herbs (rarely short-lived perennial), glabrous or variously pubescent. Leaves linear to oblong, entire. Capitula heterogamous or homogamous, solitary or clustered. Involucre globular to cylindrical or turbinate, radiant or not; bracts multiseriate, scarious, papery, or thinly cartilaginous; stereome oblong to linear, thin; claw of inner involucral bracts flat, scarious. Receptacle rounded to conical, smooth or pitted, glabrous or puberulous. Florets 5 to numerous, bisexual, or the innermost male, 5-merous. Corolla actinomorphic to zygomorphic, almost glabrous to variously pubescent, cylindrical or expanded above, cells of inner epidermis of lobes equilateral to broad-oblong, smooth or papillose. Stamens: anther appendage narrow-deltoid to ovate or oblong, cells narrow-oblong; anther tails filamentous, weak; collar oblong or narrow-oblong. Style apex truncate to broadly deltoid, prominently papillose. Achene obovoid, compressed obovoid, or ellipsoid, 1.5-3.5 mm long, densely silky or moderately short pilose; carpopodium a short glabrous slightly tumid hollow base or absent; pericarp crustaceous, thinly coriaceous, or papery, vascular strands in medial or oblique position; testa membranous to thinly coriaceous, free from or fused to pericarp, the vascular strand 1/2 to 3/4 encircling seed; crystals in testa present or absent. Pappus persistent or caducous; bristles linear-lanceolate, plumose, the terminal cilia frequently rounded or clavate.

Note 1. Candolle (1838) placed *Helipterum polygalifolium* and *H. diffusum* in his section *Leiochrysum*, I have selected the first of these as the lectotype since it better agrees with his sectional description.

Note 2. Gray (1852) included two species in *Pteropogon* sect. *Facelioides* of which one was *P. pygmaeus*, the type of *Pteropogon*. His sectional name is therefore superfluous.

Rhodanthe anthemoides (Sprengel) Paul G. Wilson, comb. nov.

Helichrysum anthemoides Sieber ex Sprengel, Syst. Veg. 3:484(1826). - *Helipterum anthemoides* (Sprengel) DC., Prod. 6:216(1838). - *Argyrocome anthemoides* (Sprengel) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia anthemoides* (Sprengel) Voss, Vilm. Blumengärtn. 3rd edn, 1:531(1895) '*anthemodes*'. *Type:* 'Nov Holl.' probably *F.W. Sieber* 344 (iso: G-DC photo seen, K, MEL 109048, 604823).

Helipterum punctatum DC., Prod. 6:216(1838). *Type:* Van-Diemen Land, *R.Gunn* 239 (holo: G-DC photo seen; ?iso: MEL 109067 *p.p.*).

Rhodanthe chlorocephala (Turcz.) Paul G. Wilson, comb. nov.

Schoenia chlorocephala Turcz., Bull. Soc. Imp. Naturalistes Moscou 24/1:193(March 1851). - *Helipterum chlorocephalum* (Turcz.) Benth., Fl. Austral. 3:641(1867). - *Argyrocome chlorocephala*

(Turcz.) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia chlorocephala* (Turcz.) Voss, Vilm. Blumengärtn. 3rd edn, 1:530(1896). *Type:* Western Australia, *J. Drummond* 4th coll. n. 199 (iso: MEL 109146, 109147, 109148).

Rhodanthe chlorocephala subsp. **chlorocephala**

[*Acroclinium multicaule* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:271(1852) as to var. ß not as to lectotype. *Syntype:* Swan river, *J. Drummond* (K).]

I am applying the epithet subsp. *chlorocephala* in a narrow sense so as to restrict it to the form represented by the type collection of this taxon. This type was collected from an unknown locality in the south-west of Western Australia; it was included in Drummond's fourth collection which was despatched to England in July 1847. According to Erickson (1969) the fourth collection consisted of plants gathered from King George Sound, Stirling Range, Porongorups, Mt Manypeaks, Cape Riche, West Mt Barren, and from north and east of Moore River. Of these various localities *Rhodanthe chlorocephala* is only known from the Moore River area but the only other specimens I have been able to match with the type are those that represent the original material of *Acroclinium multicaule* A.Gray var. ß which is an apparently undated and unnumbered collection of Drummond's in herb. K. It is possible that the specimens that form the bases of *R. chlorocephala* and *A. multicaule* var. ß are from the same Drummond collection.

Rhodanthe chlorocephala subsp. **rosea** (Hook.) Paul G. Wilson, comb. et subsp. nov.

Acroclinium roseum Hook., Bot.Mag. t.4801(1854). - *Helichrysum grayi* F. Muell., Fragm. 5:200(1866). - *Helipterum roseum* (Hook.) Benth., Fl. Austral. 3:640(1867). - *Argyrocome rosea* (Hook.) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia rosea* (Hook.) Voss, Vilm. Blumengärtn. 3rd edn, 1:531(1896). Type citation: 'A native of the interior of South-west Australia, between the Moore and Murchison rivers from whence the seeds were sent in 1853 by Mr. James Drummond, together with dried specimens (No. 157 of his Herbarium).' *Lectotype* (here chosen): *J. Drummond* 6th coll. no. 157 (lecto: K; isolecto: NSW 180743). *Syntype:* Hort. Kew. 1854 from *Drummond* S.W. Australia (K).

Acroclinium multicaule A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:271(1852). - *Helichrysum drummondii* F. Muell., Fragm. 5:200(1866). *Lectotype* (here chosen): Swan River, *J. Drummond* (lecto: ?K *n.v.*; ?iso: P, 'J. Drummond 349', annotated by A. Gray in 1851).

Acroclinium roseum var. *grandiflorum* Nicholson, Ill. Dict. Gard. 1:18(1884). - *Helipterum roseum* var. *grandiflorum* (Nicholson) Chitt., Dict. Gardening 2nd edn, 2:978(1951). *Type:* not indicated.

Acroclinium roseum var. *album* hort. ex Nicholson, Ill. Dict. Gard. 1:18(1884). - *Helipterum album* (Nicholson) L. Bailey, Cycl. Amer. Hort. 2:726(1900). - *Helipterum roseum* f. *album* (Nicholson) Moldenke, Phytologia 2:312(1947). *Type:* not indicated.

Helipterum roseum var. *nigropapposum* Ostenf., Biol. Meddel. Kongel. Danske Vidensk. Selsk. 3/2:140(1921). Type citation: 'Perth, King's Park, in open sandy places (No.874; 10.Sept.1914).' (iso: MEL 110494).

[*Helipterum troedelii* var. *patens* Ewart, J. White & B. Rees, Proc. Roy. Soc. Victoria 22 n.s.:15(1909). - *Helipterum roseum* var. *patens* (Ewart *et al.*) J. Black, Trans. & Proc. Roy. Soc. South Australia 45:21(1921) as to syntype 'Fraser Range, 1891, R. Helms', not as to lectotype. *Syntype:* Fraser Range, 4 Oct.1891, *R. Helms* (MEL 110705, AD 96343013, NSW 180742).]

The involucral bracts in this subspecies can be pink or white.

Note. Asa Gray, under *Acroclinium multicaule*, described a variety *a* in which the ray bracts were white, and a varicty ß in which the ray bracts were 'subaeruginosis'. The lectotype cited above is of the var. *a* which corresponds to *R. chlorocephala* subsp. *rosea*, var. ß is referred to subsp. *chlorocephala*.

Rhodanthe chlorocephala subsp. **splendida** (Hemsley) Paul G. Wilson, subsp. et comb. nov.

Helipterum splendidum Hemsley, Bot. Mag. t.7983(1904). - *Helipterum roseum* var. *album* Ewart *et al.*, Proc. Roy. Soc. Victoria n.s. 23:59(1910) *nom.illeg.* Type citation: 'Kew is indebted to Mr G.F. Berthoud, of Waroona, near Drakesbrook, W. Australia, for dried specimens and seeds of this handsome plant, which he labelled:- "Native of North-western Districts." There are also herbarium specimens collected in open plains at Menzies, about a hundred miles north of Coolgardie, in about 29° 30'S. lat. and 121° E. long., by Cecil Andrews.' *Lectotype* (here chosen): North-western Districts of Western Australia, 26.x.1903, *G.F. Berthoud* (lecto: K; isolecto: MEL 110704).

Rhodanthe chlorocephala is extremely variable. At one extreme is found in the Shark Bay area of Western Australia a large flowered variant with long (to 30 mm) cream-coloured limbs to the inner involucral bracts. At the other extreme is found a variant in the Nullarbor area of South Australia and Western Australia with small heads and short (c. 5 mm) white limbs. Between these extremes is a continuity of forms. In addition to the differences in size of the heads and bracts, and the presence of a black spot at the base of the limb in the large cream bracted variant, there are found colour forms that range from white to cream and various shades of pink. Hooker noted that in cultivation *Acroclinium roseum* had much larger heads than the wild plant from which the seed was obtained and this difference is apparent when comparing the Drummond herbarium material with Hooker's illustration.

The variant described by Ostenfeld as *Helipterum roseum* var. *nigropapposum* was collected in Perth; it is almost identical to Drummond's collection no. 157 (from between the Moore and Murchison Rivers) on which the name *Acroclinium roseum* was based.

The name *A. multicaule* A. Gray was based on two variants, as is noted above, of which one corresponds to subsp. *chlorocephala* and the other to subsp. *rosea*.

The name *A. roseum* var. *grandiflorum* Nicholson was based on a large-headed rose-coloured variant while var. *album* Nicholson was based on a white variant, both variants are presumably forms of subsp. *roseum*.

Ewart *et al.* (1909) based the name *H. troedelii* var. *patens* on two collections of which one, the lectotype, is *Rhodanthe troedelii s.str.* while the other (from the Fraser Range in Western Australia) is of the small 'Nullarbor' variant of subsp. *rosea*. It was the latter specimen that J.M. Black first saw

and therefore transferred the variety to *H. roseum* in the first edition of the Flora of South Australia (1929).

Rhodanthe collina Paul G. Wilson, sp. nov. (Figure 1)

Annua erecta ad 20 cm alta. Caules graciles, atro-rubri, sparse puberuli et glanduloso punctati. Folia caulina alterna, aliquantum coriacea linearia vel anguste oblonga, integra, 8-15 mm longa, obtusa, margine saepe recurva, supra glabra, infra glanduloso punctata. Capitula heterogamia, solitaria, terminalia. Involucrum hemisphericum, c. 5 mm altum, radians. Bracteae multi-seriatae, glumaceae glabrae; bracteae intimae: ungue late elliptico c. 5 mm longo, stereomate lineari, duro, lamina oblongo-elliptica c. 6 mm longa, alba. Receptaculum conicum, glabrum. Flosculi numerosi, bisexuales vel masculi. Corolla actinomorpha, anguste cylindracea, c. 3.5 mm longa; lobi 5, triangulares, c. 0.4 mm longi; intra dense papillosi. Antherarum loculi c. 1 mm longi; appendix oblongo-ellipticus, acutus c. 0.4 mm longus, margine minute crosa, cellulis anguste oblongis, tenui-parietibus; caudi tenues, debiles. Styli rami apicem versus aliquantum latiores, apice rotundato longe papilloso, nervo gracili in medio rami terminanti. Achenium obovoideum c. 2 mm longum, atro-rubiginosum, dense albo-hirsutum, pilis crasso-parietibus; carpophorum annulare; pericarpium crustaceum; testa membranacea, atro-violaceum, ad pericarpio ± adnatum. Pappus in statu integro tarde deciduus; setae lineari-acuminatae, breviter plumosae, ciliis terminalibus clavatis.

Typus: Paynes Find - Thundelarra road near Monger Lake, 29° 03' S, 117° 17' E, low hill of quartzite boulders, 27 Sept. 1986, *Paul G. Wilson* 12300 (holo: PERTH; iso: AD, BRI, CANB, K, MEL, NSW).

Annual erect herb to 20 cm high branching at and above base. Major axes slender, dull reddish brown with a few small septate hairs and sessile globular glands. Leaves cauline, alternate, somewhat leathery, linear to narrow-oblong or spatulate, entire, 8 x 0.5 - 15 x 2 mm, obtuse, margin often recurved (at least when dry), glabrous above, sparsely covered below with sessile globular glands and with a few shorter septate hairs on midrib. Capitula heterogamous, solitary on slender leafless terminal peduncles. Involucre hemispherical, c. 5 mm high, radiant; bracts glumaceous, glabrous; outer and intermediate bracts elliptic, to 6 mm long, pale brown, with a short flat stereome; inner bracts: claw broad-elliptic, hyaline, c. 5 mm long with a hard linear stereome c. 2/3 its length; lamina oblong-elliptic, obtuse, c. 6 mm long, 2.5 mm wide, white. Receptacle conical, glabrous. Florets numerous, the outer bisexual and the inner male. Corolla narrow-tubular, somewhat constricted below middle, c. 3.5 mm high, yellow, sparsely puberulous towards base, wall thickened in lower half, vascular strands extending to base of lobes; lobes 5, short erect, triangular, c. 0.4 mm long, all densely papillose within. Stamens: anther loculi c. 1 mm long; anther appendage oblong-elliptic, acute, c. 0.4 mm long, minutely crose on margin, cells narrow-oblong, walls unthickened except for a marginal row of small cells with thickened walls; anther tails very thin and delicate. Style branches broadened towards tip and with a rounded long-papillose apex; vascular strand very slender and terminating about half way along style branch. Achene obovoid, c. 2 mm long, very dark reddish brown, densely white-hirsute with thich-walled hairs, myxogenic; carpopodium annular; pericarp crustaceous with lignified reddish brown radial walls; testa very thin and weak, dark mauve, with scattered flat crystals, ± fused to pericarp. Pappus tardily deciduous as a whole; bristles linear-acuminate, ± equal to corolla, united in a short ring at base, shortly plumose, the terminal cilia clustered and clavate.

Distribution. Near Yalgoo, central western Western Australia, in the far western area of the Austin Botanical District.

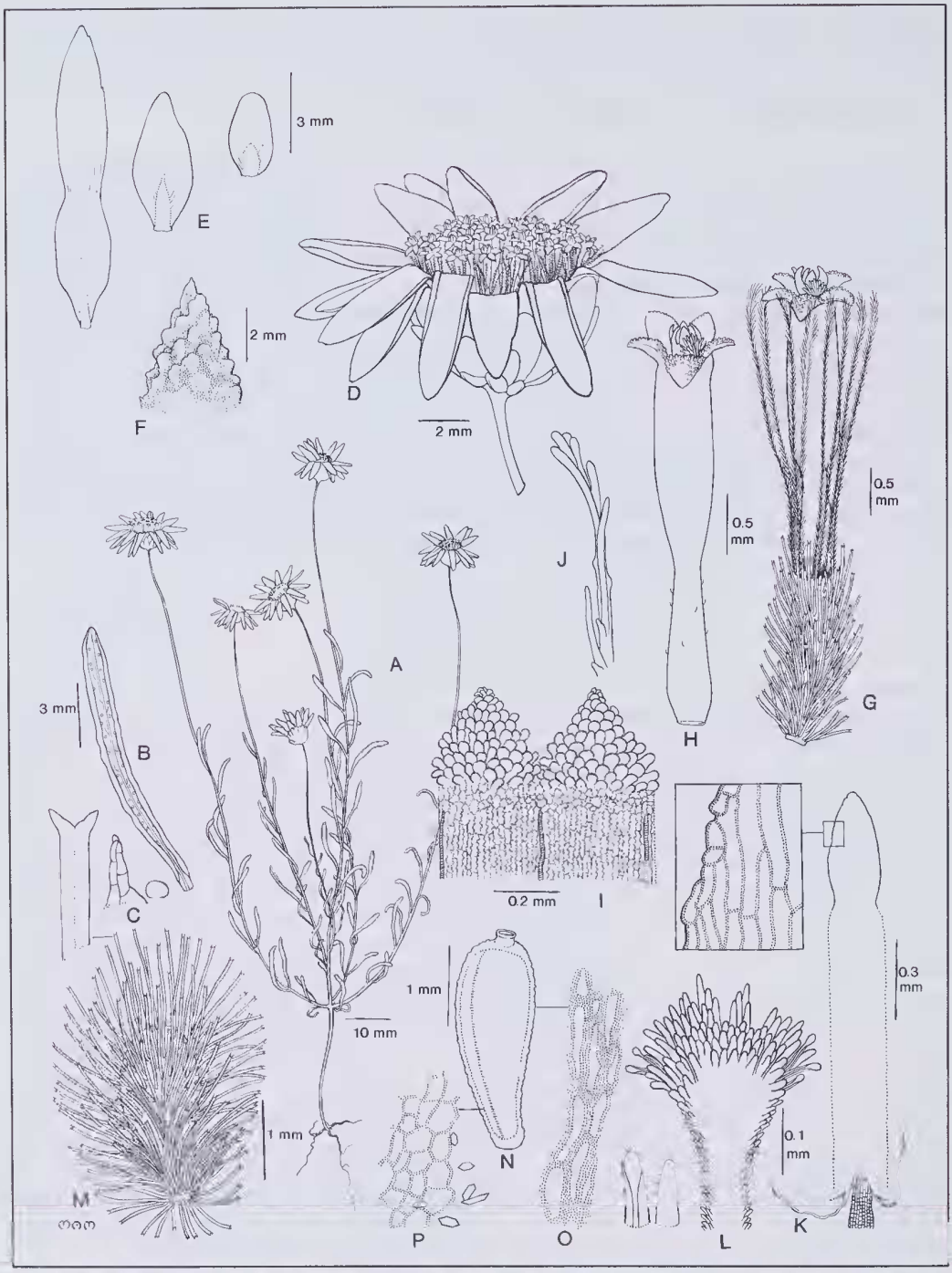

Figure 1. *Rhodanthe collina*. A - Habit. B - Undersurface of leaf. C - Multicellular hispidulous and globular glandular trichomes from undersurface of leaf. D - Capitulum. E - Inner, intermediate, and outer involucral bracts. F - Receptacle. G - Floret. H - Corolla. I - Inner surface of apex of corolla. J - Apex of pappus bristle. K - Anther with enlargement of margin of appendix (tails drawn recurved for space exigencies). L - Apex of style with two papillae enlarged. M - Achene with apex of duplex hair enlarged. N - Achene showing position of seed and of its vascular strand. O - Enlargement of epidermis of pericarp. P - Enlargement of epidermis of testa showing crystals. From *B.H. Smith* 460.

Specimens examined. WESTERN AUSTRALIA: 112 mile peg on the Yalgoo Road, *A.M. Ashby* 2976 (AD, PERTH); Mt Gibson, *B.H. Smith* 460 (MEL, PERTH); Mingenew Hill, 29 Aug.1957, *R.F. Watson* (PERTH).

Habitat. On rocky hills in exposed situations.

Notes. This species would appear to have no close relatives although in habit and in indumentum it is similar to *Rhodanthe diffusa*. The unique anther appendages, style apices, and achenes combine to make it a very distinct species.

Rhodanthe corymbiflora (Schldl.) Paul G. Wilson, comb. nov.

Helipterum corymbiflorum Schldl., Linnaea 21:448(1848); Sonder, Linnaea 25:519(1853). - *Argyrocome corymbiflora* (Schldl.) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia corymbiflora* (Schldl.) Voss, Vilm. Blumengärtn. 3rd edn, 1:532(1895). Type citation: 'Dr Behr' [South Australia] (?holo: MEL 604825).

Note. Sonder, *l.c.*, cited the Behr collection as coming from 'Fiedler's section, Novemb.' This locality is in the Hundred of Moorooroo, County Light, near the present town of Nuriootpa (South Australia). The putative type sheet in herb. MEL has on it three specimens, two of which are somewhat etiolated whole plants while one is a single stem off a mature plant. A note on the sheet by Sonder states 'culmi e seminibus plantae behrianae!' It would appear likely that the two whole plants represent those raised by Sonder while the single stem is the type specimen collected by Behr since it corresponds to the following comment made by Schlechtendal, *l.c.*, 'Unicum specimen vidi, ramum 5 poll. longum'.

Rhodanthe cremea Paul G. Wilson, sp. nov. (Figure 2)

Annua erecta, c. 25 cm alta, sparse lanosa, pilis glandulosis absentibus. Axes majores graciles, solitarii vel numerosi, haud ramosi, apicem versus lanosi aliter glabri. Folia caulina alterna, integra, linearia vel anguste obovata, acuta vel obtusa, ad 30 mm longa, apicem versus caulorum absentia. Capitula solitaria ad caules terminalia posita. Bracteae exteriores scariosae vel chartaceae, latissime ovatae vel latissime ellipticae, nitidae, ad 7 mm longae, pallido brunneae; bracteae intermediae late ellipticae, ad 15 mm longae, ad apicem malvinae; bracteae intimae: unguis late obovatus, stereomate oblongo, vix incrassato, nervo singulari ad apicem extenso; lamina petaloidea, anguste elliptica, ad 20 mm longa, pallido cremea vel ad basim atropurpurea. Receptaculum discoideum, margine areolae pilosa aliter glabrum. Flosculi numerosi, bisexuales vel flosculis intimis masculinis. Corolla: tubus anguste cylindraceus, c. 2 mm longus; faux valde zygomorpha anguste turbinata, c. 1 mm longa; lobi 5, c. 1.5 mm longi, lobis tribus abaxialis recurvis, cremeis, profunde fissa, intra laevibus, lobis duobus adaxiali erectis, ad apicem connatis, rubiginosis, intra papillosis, nervis corollae ad apicem lobulorum extensis. Antherarum appendix sterilis late elliptica, obtusa, 0.2 mm longa; cellulae oblongae, parietibus tenuibus, cellulis parietibus incrassatis immixtis; cellulae marginales manifeste discretae. Anthcrarum caudae filamentosae, debiles. Styli apex truncatus, nervo prominenti ad apicem extenso. Achenium compresse turbinatum, c. 2.5 mm longum, facie abaxiali sericeum, adaxiali hirsutum; carpophorum absens; pericarpium chartaceum; testa membranacea ad pericarpium adnata, nervo in positione medio cingenti. Pappi setae corollam leviter excedentes; in parte inferiore persistentes, anguste ellipticae; in parte superiore caducae, filamentosae, apice versus plumosae, ad extremum penicillatae ciliis clavatis ornatis, aliter denticulatae.

Typus: Western Australia, 6.5 km east of the turnoff to Useless Loop; abundant on flats, dominating a stony clay depression with *Acacia tetragonophylla* and *Acacia* sp., 16.viii.1986, *R.C. Chinnock* 6760 (holo: AD; iso: K, MEL, PERTH).

Erect annual to 25 cm high, branching at base; major axes slender, solitary or several, simple, woolly near apex otherwise glabrous, glandular hairs absent. Leaves cauline, alternate, entire, linear to narrow-obovate, acute to obtuse, to 30 mm long, absent towards apex of stem. Capitula solitary, terminal to stems. Involucre hemispherical, c. 6 mm high. Bracts multiseriate, scarious or papery, glabrous; outer bracts scarious, very broadly ovate or broadly elliptic, to 7 mm long, pale brown; intermediate bracts broad-elliptic, to 15 mm long, pale brown with mauve apex; inner bracts: claw broad-obovate, stereome broad-oblong, scarcely thickened,with a single nerve extending to apex, lamina petaloid, narrow-elliptic, to 20 mm long, pale cream, often with a dark purple band at base. Receptacle disc-shaped, c. 5 mm broad, pilose on margin of areolae otherwise glabrous. Florets numerous, bisexual or the inner ones male. Corolla almost glabrous: tube cylindrical, c. 2 mm long; throat narrow-turbinate, strongly zygomorphic, c. 1 mm long; lobes 5, c. 1.5 mm long, the three abaxial lobes deeply divided, recurved, cream coloured, smooth within, the 2 adaxial lobes fused to near apex, dark reddish brown, papillose within; vascular strands extending to tip of lobes. Anther appendage broad-elliptic, obtuse, 0.2 mm long; cells oblong, thick-walled cells interspersed among thin-walled cells; marginal cell row clearly demarcated; anther tails filamentous and weak. Style tip truncate, the vascular strand stout and extending to apex. Achene compressed turbinate, c. 2.5 mm long, silky on abaxial face and hirsute on adaxial face; carpopodium absent; pericarp papery; testa membranous, fused to pericarp, the vascular strand encircling seed in medial position. Pappus bristles slightly exceeding corolla; lower half narrow elliptic, barbellate and persistent; upper half filamentous and deciduous, towards apex plumose with the terminal cilia penicillate and clavate, towards base barbellate.

Distribution. Western Australia, from the south end of Hamelin Pool, Shark Bay, eastwards to the North West Coastal Highway.

Specimens seen. WESTERN AUSTRALIA: 493 mile peg North West Highway, *T.E.H. Aplin* 3282 (PERTH); 5 miles west of Hamelin Station, *J.W. Green* 1444 (PERTH); 22 km west of Overlander Roadhouse on Denham road, *N.S. Lander* 1322 (PERTH); 28 km NNW of Overlander Roadhouse, North West Coastal Highway, *E.N.S. Jackson* 3121 (AD *pro parte*); 3 km from Overlander Roadhouse, *P.S. Short* 422 (AD *pro parte*); 20 km north of Billabong Roadhouse, *P.S. Short* 2453 (PERTH).

Habitat. Usually found in red sand over loam.

This species appears to be related to *Rhodanthe chlorocephala.* It superficially very closely resembles *R. chlorocephala* subsp. *splendida* which grows intermixed with *R. cremea* near Shark Bay and some herbarium collections consist of material of both species. *Rhodanthe chlorocephala* may be distinguished by the spherical glandular hairs on leaves and stems, the absence of woolly hairs, the regular corollas, and the evenly silky achenes.

Those variants of *Cephalipterum drummondii* and of *R. chlorocephala* subsp. *splendida* that have large white involucral bracts often resemble *R. cremea* in having a dark purple band at the base of these bracts. Since the three species grow together in the Hamelin Pool region it is likely that they attract the same pollen vectors.

The epithet *cremea* (cream coloured) refers to the colour of the inner involucral bracts.

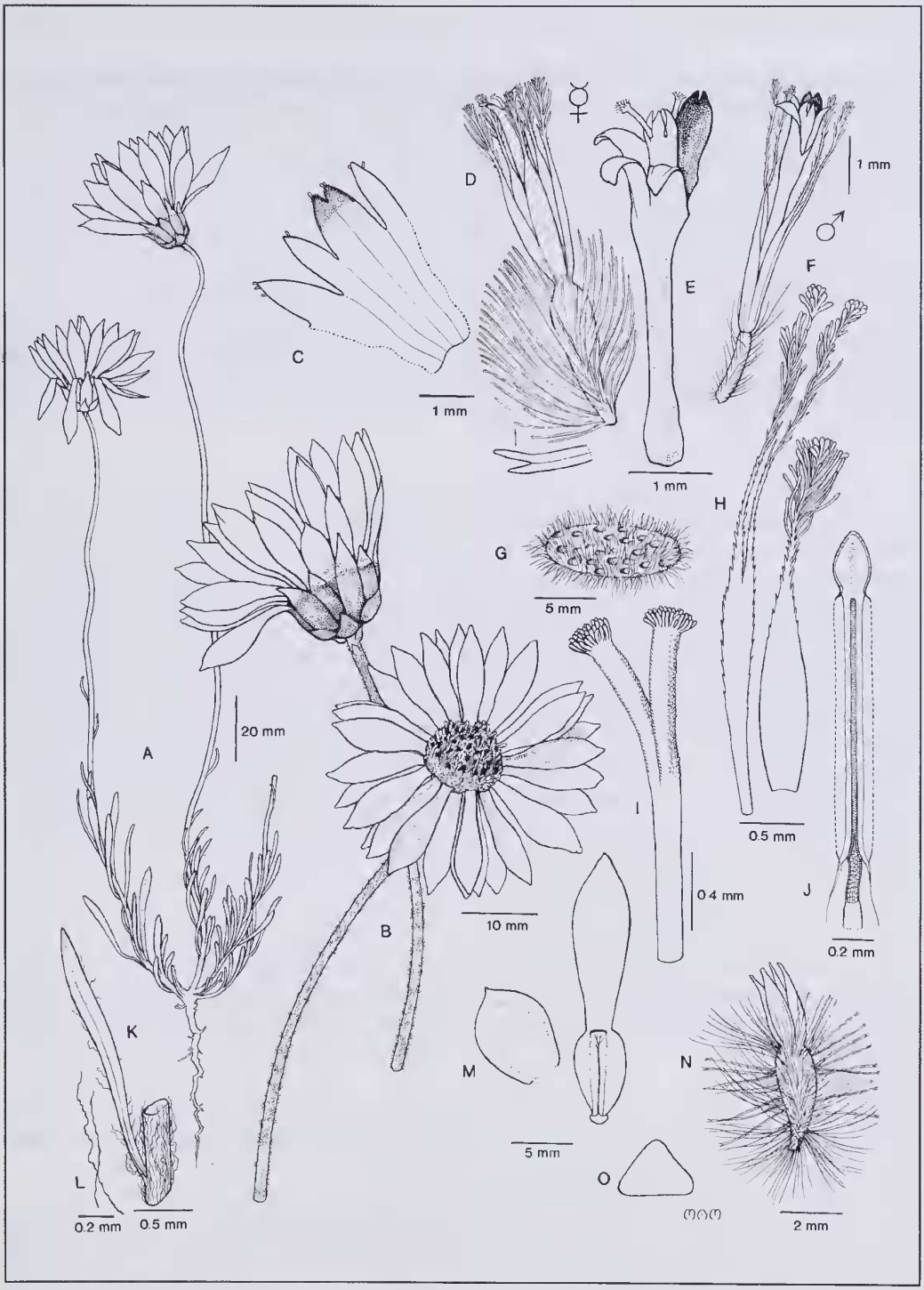

Figure 2. *Rhodanthe cremea*. A - Habit. B - Capitulum. C - Corolla opened out. D - Bisexual floret. E - Corolla. F - Male floret. G - Receptacle. H - Pappus bristles. I - Style branches. J - Anther. K - Leaf. L - Leaf hairs. M - Outer and inner involucral bracts. N - Achene. O - T.S. achene. From *J.W. Green* 1444.

Rhodanthe diffusa (Cunn. ex DC.) Paul G. Wilson, comb. nov.

Helipterum diffusum A.Cunn. ex DC., Prod. 6:216(1838). *Type:* Forest grounds at the base of Peels range, Interior of New South Wales, June 1817, *A. Cunningham* (holo: G-DC photo seen).

Rhodanthe diffusa (DC.) Paul G. Wilson subsp. **diffusa**

This taxon represents the yellow-rayed variant.

Rhodanthe diffusa subsp. **leucactina** (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum polygalifolium var. *leucactinum* F. Muell., Fragm. 10:107(1877). Type citation: 'Darling's River (Andrae), Warrego (Bailey), Curruwillughi (Dalton), Ballandool (Looker).' *Lectotype* (here chosen): Warrego district, *F.M. Bailey* (MEL 110257).

The taxon represents the white-rayed variant.

Note. The only substantial difference between the two subspecies is in the colour of the radiant involucral bracts, however the stems of northern variant of subsp. *leucactina* are sometimes branched above and have a minutely glandular hispidulous indumentum beneath the capitula rather than cottony. The typical subspecies is found in south-eastern New South Wales between Hillston and Narrandera while the subsp. *leucactina* is found further north from Nyngan north to south-eastern Queensland. Both subspecies have been confused with other species: the yellow subspecies was synonymized by Bentham (1867) (and subsequently confused in some herbaria) with *Helipterum polygalifolium*, while the white has been confused with *H. anthemoides*. *Rhodanthe polygalifolia* may be readily distinguished by being glabrous apart from the minute globular glands on the adaxial surface of the leaves (in *R. diffusa* the leaves bear glands and multiseptate hairs on the stems and on both surfaces of the leaves), while *R. anthemoides* may be distinguished by being a perennial, by the generally thicker leaves and embedded globular glands, and by the reddish brown linear midrib on the claws of the involucral bracts.

Rhodanthe fuscescens (Turcz.) Paul G. Wilson, comb. nov.

Helipterum fuscescens Turcz., Bull. Soc. Imp. Naturalistes Moscou 24/2:80(1851). - *Podotheca fuscescens* (Turcz.) Benth., Fl.Austral. 3:602(1867). - *Podosperma fuscescens* (Turcz.) F. Muell., Fragm. 12:22(1882). - *Argyrocome fuscescens* (Turcz.) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Western Australia, *J. Drummond* 5th coll. (suppl.) n.64 (holo: KW photo seen; iso: K, MEL 110215, PERTH).

Acroclinium phyllocephalum A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:271(1852). Type citation: 'South-west Australia, *Drummond* (received in 1850)' *n.v.*

This species is very similar to *Rhodanthe oppositifolia* from which it differs in having leaves that subtend the capitula and in having very short and brown involucral bracts. *Rhodanthe fuscescens* is known only from the Drummond types and from *E. Pritzel* 695. The Drummond sheets on which the names *H. fuscescens* and *A. phyllocephalum* were based are probably duplicates of the same collection (Short 1983); both sheets lack locality data. The collection *Pritzel* 695, dated 1901, is almost identical to the Drummond; it came from near Cranbrook in south-west Western Australia which is about 400 km from the nearest locality for *R. oppositifolia*.

Rhodanthe gossypina Paul G. Wilson, sp. nov.

Herba annua erecta gossypina. Folia caulina, alterna, linearia vel anguste oblonga, acuminata, 2-4 cm longa. Capitula homogama in corymbis terminalibus ordinata. Involucrum turbinatum, c. 4 mm altum, radians; bracteae c. 3-seriata; bracteae intermediae ellipticae c. 5 mm longae, hyalinae, lanato ciliatae, ad apice brunneolae, stereomate anguste oblongo, viridi, in parte superiore gossypino; bracteae intimae: unguis late obovatus c. 4 mm longus, hyalinis, gossypino ciliatus, stereomate anguste oblongo, gossypino, in parte superiore pilis resinosis rubiginosis ornatum; lamina patula, ovata, c. 4 mm longa, alba. Receptaculum conicum, c. 0.7 mm diam. Flosculi c. 15, bisexuales. Corolla c. 3 mm longa, 5-lobata; lobi inequales, oblongo-triangulares, intra laeves, lobo abaxiali c. 1.5 mm longo, ceteris c. 1 mm longis; nervi corollae in tubo terminantes. Antherae: appendix sterilis elliptica c. 0.4 mm longa, parietibus cellularum nec incrassatis; caudis filamentis, debiles. Styli apex ± truncatus. Achenium ellipsoideum, 1.5-3 mm longum, subtiliter pilosum; carpophorum annulare; pericarpium chartaceum, translucens; testa aliquantum coriacea, brunnea, ad pericarpium adnata, nervo c. 2/3 cingenti. Pappus persistens; setae lineari-acuminatae corollam aequantes, omnino pilosae.

Typus: Queensland: Mitchell district, 36.9 km SE of Winton on Longreach road, 19 Sept. 1984, *R.J. Chinnock* 6106 (holo: AD; iso: PERTH).

Annual erect cottony herb; stems slender, single or branching at base, to 20 cm high. Leaves cauline, alternate, linear to narrow-oblong, acuminate, 2-4 cm long, 1-5 mm wide. Capitula homogamous, in terminal corymbs. Involucre turbinate, c. 4 m high, radiant; bracts c. 3-seriate; intermediate bracts elliptic, c. 5 mm long, hyaline, woolly ciliate, brown-tinged towards apex, with narrow-oblong green stereome cottony in upper half, c. 2 mm long; innermost bracts: claw broad-obovate, c. 3.7 mm long, 2 mm wide, hyaline, cottony ciliate, stereome narrow-oblong extending to near apex, cottony and with dark reddish brown resinous hairs in upper half; lamina spreading, ovate, c. 4 mm long, 2 mm wide, white. Receptacle conical, c. 0.7 mm diameter Florets c. 15, all bisexual. Corolla c. 3 mm long, narrow-cylindrical below, somewhat broader above, sparsely puberulous in lower half, yellow, vascular strands terminating well below lobes; lobes oblong-triangular, 0.5-1 mm long, not papillose within, glabrous outside, the abaxial lobe more deeply divided (up to 1.5 mm long). Anthers: appendage elliptic, c. 0.4 mm long, smooth, cells not thickened, very pale brown or the marginal ones clear; tails filamentous, weak. Style apex ± truncate to slightly rounded, shortly papillose. Achene ellipsoidal, 1.5-3 mm long, pilose with fine very pale brown hairs; carpopodium a short glabrous ring; pericarp translucent, papery, very pale brown; testa somewhat leathery, brown, fused to pericarp when mature; vascular strand of testa extending c. 2/3 around seed in medial position. Pappus bristles linear-acuminate, ± equal to corolla, united in a ring at base, persistent, pilose throughout, the terminal cilia somewhat thicker and rounded at apex.

Distribution. Southeastern Northern Territory, southwestern Queensland, extreme northeastern South Australia and northwestern New South Wales.

Specimens examined (selection only). QUEENSLAND: 100 km WNW of Charleville, *C. Sandercoe* 369 (BRI); Near Windorah, *S.T. Blake* 12079 (BRI).
NEW SOUTH WALES: 17.5 km from Louth on Telpa road, *C.W.E. Moore* 7794 (CANB).
SOUTH AUSTRALIA: Kudriemitchie Waterhole, *L.D.Williams* 8156 (AD).
NORTHERN TERRITORY: 7.5 mi N of Tobermorey homestead, *G. Chippendale* (NT 2961).

Habitat. In open situations on heavy soil that is frequently subject to flooding.

Flowering time. June to September.

This species is similar to *Rhodanthe corymbiflora* and *R. microglossa* with which two species it has been confused in herbaria. It differs from the former in having a smaller involucre with the bract-lamina about half as long, and in the possession of dark resinous hairs on the stereome of the inner bracts. From the latter it differs in having a more open inflorescence, dark resinous hairs on the inner bracts, much longer radiating laminae, and in having a smooth throat to the corolla.

Rhodanthe gossypina was recognised as a distinct taxon by C.T. White (herb. BRI) who evidently intended to describe it as a variety of *Helipterum corymbiflorum* but never did so (R.W. Johnson, pers. comm.).

The solitary collection from New South Wales, cited above, comes from a site geographically isolated from the other locations. It is morphologically distinct for the stereomes of the inner involucral bracts do not have glandular hairs and the lobes of the corolla are equal in length. For these reasons it may be found to represent a distinct species.

The specific epithet refers to the cottony indumentum that covers the plant.

Rhodanthe humboldtiana (Gaudich.) Paul G. Wilson comb. nov.

Helichrysum humboldtianum Gaudich. in Freyc., Voy. Uranie 465(1830) t.88(1829). - *Helipterum humboldtianum* (Gaudich.) DC., Prod. 6:216(1838). - *Schoenia humboldtiana* (Gaudich.) Walpers, Repert. Bot. Syst. 6:244(1846). - *Pteropogon humboldtianus* (Gaudich.) F. Muell., Linnaea 25:415(1853). - *Argyrocome humboldtiana* (Gaudich.) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia humboldtiana* (Gaudich.) Voss, Vilm. Blumengärtn. 3rd edn, 1:532(1896). Type citation: 'In Novae-Hollandiae ora occidentale (baie des Chiens-Marins)', 1830, *Gaudichaud. Lectotype* (here chosen): P photo seen; isolecto: G-DC photo seen.

Helipterum sandfordii Hook., Bot. Mag. t.5350(1862). *Type: J. Drummond* 160, between Moore and Murchison rivers; 1860, *Burgess*; cult. Thompson from seeds from Major Sandford, W.A. *Isosyntypes: J. Drummond* 160 (MEL 109493, NSW).

Helipterum largiflorens F. Mucll., Fragm. 3:135(1863). Type citation: 'Ad sinum Champion bay et flumen Murchison. Walcott et Oldfield.' *Lectotype* (here chosen): Champion Bay, *A. Oldfield* (MEL 109501).

Helipterum clementii Domin, Biblioth. Bot. 89:667(1929). Type citation: 'Nordwest-Australien: zwischen Ashburton- und De Gray River, E. Clement'. Type *n.v.*

Rhodanthe microglossa (Maiden & E. Betche) Paul G. Wilson, comb. nov.

Helipterum microglossum Maiden & E. Betche, Proc. Linn. Soc. New South Wales 22:151(1897). *Type:* Tarella, New South Wales, Aug. 1887, *W. Bäuerlen* 131 (holo: NSW 181467).

Helipterum corymbiflorum var. *microglossa* F. Muell. ex Benth., Fl. Austral. 3:647(1867). - *H. microglossa* (Benth.) Tate, Trans & Proc. Roy. Soc. South Australia 22:121(1898). *Lectotype* (here chosen): Goyinga mountains, 6 & 7 Nov. 1860, *Victorian Expedition* (MEL 110255).

Note. It was unclear from the paper by Maiden and Betche whether they intended to describe a new species based on the Bäuerlen collection or whether they intended to make a new combination based on *Helipterum corymbiflorum* var. *microglossa*; I have assumed the former intention, partly because the epithet was changed from a substantive to an adjective and partly because the format used was the same as that for other new species described in the paper. Ralph Tate (1898 *loc.cit.*) claimed to have published the species combination in the Trans. & Proc. Roy. Soc. South Australia 6:104(1883), however, in that paper the name *Helipterum microglossa* was not validly published since it appeared without citation of either author or basionym, and without a description.

Rhodanthe oppositifolia (S. Moore) Paul G. Wilson, comb. nov.

Helipterum oppositifolium S. Moore, J. Bot. 35165(1897). *Type:* Near Coolgardie, Sept.1895, *S.Moore* (holo: BM; iso: MEL 110309).

Griffithia helipteroides J. Black, Trans. & Proc. Roy. Soc. South Australia 37:122(1913). Type citation: 'Gawler Ranges, Eyre Peninsula (*S.A.White*, September, 1912)' (holo: AD; iso: K).

subsp. **oppositifolia**

subsp. **ornata** Paul G. Wilson, subsp. nov.

Folia lineari-acuminata, c. 30 x 2 mm. Involucrum hemisphericum, c. 6 mm altum; lamina bracteae interiorum elliptica, 10 mm longa, flava.

Typus: Western Australia: 3 km NW of Tamala Homestead, 26° 40' S, 113° 42' E, at foot of calcrete ridge on edge of samphire flat, powdery white clay loam on sheet calcrete, 25 August 1991, *S.D. Hopper* 8112 (holo: PERTH; iso: CANB, K, MEL, S).

Leaves linear-acuminate, c. 30 x 2 mm. Involucre hemispherical, c. 6 mm high; inner bracts with a prominent elliptic yellow lamina c. 10 mm long.

Distribution. Only known from the southern margin of Freycinet Estuary in Tamala station, Western Australia. Found growing on calcrete rises on edge of saline flats.

Additional specimens seen. WESTERN AUSTRALIA: 13.5 km W of Tamala homestead road on Useless Loop road, *S.D. Hopper* 8113 (PERTH); Tamala Station, 20 July 1988, *Ph. Morat* 8212 (P).

This subspecies differs from the typical in having larger capitula and much larger lamina to the inner involucral bracts which in the typical subspecies are only 2-3 mm long. Subsp. *oppositifolia* is also found in the Shark Bay region but evidently not in association with subsp. *ornata*.

Rhodanthe polygalifolia (A.Cunn. ex DC.) Paul G. Wilson, comb. nov.

Helipterum polygalifolium A.Cunn. ex DC., Prod. 6:216(1838). - *Argyrocome polygalifolia* (DC.) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Molle's Plains, Lachlan river, New South Wales, 1817, *A. Cunningham* (holo: G-DC photo seen).

Rhodanthe propinqua (W. Fitzg.) Paul G. Wilson, comb. nov.

Helipterum propinquum W. Fitzg., J. W. Austral. Nat. Hist. Soc. No. 1:24(May 1904). *Lectotype* (here chosen): Nannine, Western Australia, Sept. 1903, *W.V. Fitzgerald* (NSW 181422; isolecto: NSW 181423, PERTH).

Rhodanthe pygmaea (DC.) Paul G. Wilson, comb. nov.

Pteropogon pygmaeus DC., Prod. 6:245(1838). - *Pteropogon australis* Nees, Linnaea 16:223(1842) *nom. illeg.*, based on above. - *Helipterum pygmaeum* (DC.) F. Muell., Rep. Babbage's Exped. 14(1859); Benth., Fl. Austral. 3:647(1867). *Type:* Molle's plains, Lachlan river, Interior west from Port Jackson, Long. 145°E, 'a remarkable pigmy plant', July 1817, *A. Cunningham* 101 (holo: G-DC photo seen).

Pteropogon drummondii A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:267(1852). - *Helipterum pygmaeum* var. *occidentale* Benth., Fl. Austral. 3:647(1867). - *Helipterum pygmaeum* var. *drummondii* (A. Gray) Ostenfeld, Dansk Bot. Ark. 3:142(1921) *nom. illeg.* - *Helipterum drummondii* (A. Gray) Ostenfeld, *l.c. Type:* Western Australia, 1849, *J. Drummond* (holo: K).

Pteropogon intermedius F.Muell., Linnaea 25:411(1853). Type citation: 'In collibus graminosis montem Rufus versus, ante Torrens tenus, ubertim rarus.' *Lectotype* (here chosen): Ad rivum Broughton, Oct. 1851, *F. Mueller* (MEL 604821).

Rhodanthe rubella (A. Gray) Paul G. Wilson, comb. nov.

Acroclinium rubellum A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:271(1852). - *Helipterum rubellum* (A. Gray) Benth., Fl. Austral. 3:641(1867). - *Argyrocome rubella* (A. Gray) Kuntze, Revis. Gen. Pl. 1:309(1891). - *Roccardia rubella* (A. Gray) Voss, Vilm. Blumengärtn. 3rd edn, 1:530(1896). Type citation: 'Between Swan River and King George Sound, *Drummond*.' *Lectotype* (here chosen): *J.Drummond* 347 (K, photo seen).

Rhodanthe rufescens Paul G. Wilson, sp. nov.

Herba annua decumbens, sparse et minute glanduloso-puberula; axes majores numerosi ad 10 cm longi. Folia caulina alterna sessilia, anguste oblonga, ad 10 mm longa, integra, obtusa. Capitula homogama, ad ramulos terminalia posita, nec radiantia. Involucrum breviter cylindraceum, 4-5 mm altum. Bracteae c. 3-seriatae, scariosae, supra stereoma sparsissime et minute glanduloso puberulae aliter glabrae; bracteae exteriores ovatae, c. 2 mm longae, stramineae; bracteae interiores obovatae, ad 5 mm longae, ad apicem rotundatae, versus basim stramineae, versus apicem violaceae vel margine apicali hyalino. Receptaculum rotundatum c. 0.7 mm diam., glabrum. Flosculi c. 7, bisexuales, actinomorphi. Corolla c. 3.5 mm longa, infra medium cylindracea, supra medium anguste cupulata; lobi 5, triangulares, c. 1 mm longi, intra ad basim papillosi; nervi ad basim laborum extensi. Antherae loculis c. 1 mm longis; appendix c. 0.3 mm longus ad apicem rotundatus, cellulis oblongis nec incrassatis; caudae filamentae, debiles. Styli apex truncatus, nervo ad basim apicis extenso. Achenium (in statu immaturo) sericeum, carpophoro absenti, pericarpio tenui, translucenti, testa tenuiter coriacea. Pappi setae lineares acuminatae, c. 2 mm longae, omnino plumosae, ciliis omnino acuminatis.

Typus: Queensland, Gregory South District, Noccundra, about 130 km west-north-west of Thargomindah, 'herbage', 11 Aug. 1987, *P.Warhurst s.n.* (holo: BRI 410267).

Annual (? decumbent) herb with many somewhat wiry stems to 10 cm long arising from base. Branches and leaves sparsely covered with minute sessile or shortly stipitate globular glands, otherwise glabrous. Leaves cauline, alternate, sessile, narrow-oblong, to 10 mm long, 1-2 mm wide, entire, obtuse. Capitula homogamous, terminal to slender lateral and main branches, sometimes subtended by a foliaceous bract. Involucre shortly cylindrical, 4-5 mm high, not radiant; bracts scarious, glabrous apart from a few minute glandular hairs on stereome, c. 3-seriate; outer bracts ovate c. 2 mm long, straw-coloured, glabrous; inner bracts obovate, to 5 mm long, rounded at apex, straw-coloured towards base, violet brown towards apex or with the tip hyaline, stereome oblong, 2/3 length of bract, flat, pale green. Receptacle rounded, c. 0.7 mm diameter, glabrous. Florets c. 7, all apparently bisexual. Corolla tube c. 3.5 mm high, cylindrical below, narrowly cup-shaped above, very sparsely puberulous, yellow; lobes 5, ovate, triangular, c. 1 mm long, papillose within in a broad ring around base of lobes; vascular strands extending to base of lobes. Stamens: anther appendage c. 0.3 mm long rounded at apex, cells oblong, not thickened; anther tails weak and filamentous. Style tip truncate, papillose; vascular strand prominent and extending to base of tip. Achene (not seen mature) silky villous all over; carpopodium absent; pericarp thin, translucent; testa thinly coriaceous, with crystals. Pappus bristles linear-acuminate, c. 2 mm long at anthesis, plumose to tip, terminal cilia not thickened.

Distribution. Only known from the type locality in south-west Queensland.

The specific epithet refers to the reddish colour of the terminal portion of the inner involucral bracts.

Rhodanthe stricta (Lindley) Paul G. Wilson, comb. nov.

Xyridanthe stricta Lindley, Sketch Veg. Swan Riv. Col. 23(1839). - *Helipterum strictum* (Lindley) Benth., Fl. Austral. 3:646(1867), *Type:* Swan River, 1839, *J. Drummond* (holo: CGE photo seen).

Pteropogon platyphyllus F. Muell., Linnaea 25:413(1853). Type citation: 'Ad margines rupestres rivulorum ad Cudnaka rariusve ibidem in planitiebus sterilibus.' *Lectotype* (here chosen): 'Ad marginis rupestris rivi Cudnaka', Oct.1851, *F. Mueller* (lecto: MEL 110685; isolecto: MEL 604829).

Helipterum strictum var. *stenocephala* S. Moore, J. Linn. Soc. 34:200(1899). *Type:* Near Coolgardie, August 1895, *S. Moore* (holo: BM photo seen).

4. Rhodanthe sect. **Achyroclinoides** (A. Gray) Paul G. Wilson, comb. nov.

Pteropogon sect. *Achyroclinoides* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:268(1852). *Lectotype* (here designated): *Pteropogon corymbosus* A. Gray.

[*Cassinia* sect. *Cassiniola* F. Muell., Fragm. 3:139(1863) *nomen sub Cassinia cuprea* F. Muell. (= *Pteropogon polycephalus* A. Gray)].

Plant variously pubescent to sub-glabrous, without sessile glands on leaves. Style apex truncate. Achene small, 1-1.5 mm long, moderately to sparsely short hirsute; carpopodium annular, glabrous;

pericarp crustaceous, thin, brown, the radial cell walls thickened; testa membranous, free or fused to pericarp. Pappus caducous.

Note. Asa Gray (1852) included *Pteropogon polycephalus* A. Gray, *P. corymbosus* A. Gray and *P. laevis* A. Gray in his section *Achyroclinoides*. These three species are all recognised here as being members of this section.

Rhodanthe ascendens Paul G. Wilson, sp. nov.

Herba annua ascendens ad 10 cm alta, modice lanosa. Folia caulina, alterna, anguste obovata, plana, 10-15 mm longa, c. 2 mm lata, sessilia. Inflorescentia corymbiformia, compacta. Capitula homogama, breviter pedunculata. Involucrum cupulatum c. 5 mm altum, 2.5 mm latum, nec radians; bracteae glumaceae, 3-4-seriatae, nitidae, bracteis intermediis interioribusque ellipticis, 4-5 mm longis, ad apicem rotundatis, ad basim sparse ciliatis aliter glabris. Receptaculum convexum, glabrum, c. 1 mm latum, bracteis receptaculi absentibus. Flosculi c. 20, bisexuales, actinomorphi. Corolla c. 3 mm longa, glabra, nervis ad apicem tubi extensis; lobi deltoidei, c. 0.5 mm longi, lobis tribus parte interiore ad basim papillosis, ceteris glabris. Antherae c. 1 mm longae; apex anguste ovatus obtusus, c. 0.3 mm longus, cellulis anguste oblongis; caudae filamentae, debiles. Styli apex truncatus, nervo prominenti ad apicem extenso. Achenium, in statu immaturo, anguste cylindraceum, 1 mm longum, breviter hirtellum; carpophorum annulare, glabrum; pericarpium tenue, translucens; testa membranacea. Pappus corollam aequans, in statu integro caducae; setae c. 15, filiformae, ad basem breviter connatae, barbellatae.

Typus: Western Australia, Gascoyne Junction; florets yellow; roadside verge, clay soil; 20 Aug. 1986, *P.S. Short* 2531 (holo: PERTH; iso: MEL *n.v.*).

Annual ascendent herb to 10 cm high, branching at base, moderately and loosely woolly. Leaves sessile, alternate, cauline, narrow obovate, obtuse, flat, 10 - 15 mm long, c. 2 mm wide. Inflorescence corymbiform, compact. Capitula homogamous, very shortly pedunculate. Involucre cup-shaped, c. 5 mm high, not radiant; bracts glumaceous, 3-4-seriate, glossy, intermediate and inner bracts elliptic, to 4.5 mm long, rounded at apex, sparsely ciliate at base otherwise glabrous. Receptacle convex, glabrous, without receptacular bracts, c. 1 mm diameter. Florets c. 20, bisexual, actinomorphic. Corolla c. 3 mm long, yellow, narrow-tubular in lower half, narrow-turbinate above, glabrous, vascular strands extending to apex of tube; lobes broad-triangular, c. 0.5 mm long, three of the lobes papillose within at base the others glabrous; cells of throat strongly undulate. Stamens: anther loculi c. 1 mm long; tip oblong-ovate, obtuse, c. 0.3 mm long, the cells narrow-oblong; tails filamentous, weak. Style arms truncate, papillose, the vascular strand prominent and extending to base of tip. Achene (in immature state) narrow-cylindrical, 1.0 mm long, shortly hirtellous with duplex hairs c. 0.1 mm long, bifid at tip, myxogenic; carpopodium a narrow glabrous ring; pericarp thin and translucent, weak; testa membranous, free from pericarp, vascular strand extending to apex of seed; endosperm persistent and forming a sheath around the embryo. Pappus bristles c. 15, ± equal to corolla, very shortly united in a ring at base, barbellate throughout, the terminal teeth rounded, caducous as a whole.

Distribution. Found only in the Carnarvon Botanical District (Beard 1980) near Gascoyne Junction, Western Australia.

Additional specimen examined. WESTERN AUSTRALIA: Middalya Station, 1989, *D.C. Norbury* 1 (PERTH).

Habitat. The type was found in clay soil on a roadside verge.

Rhodanthe ascendens is very similar to *R. nullarborensis* from which it differs most obviously in having broader leaves and larger capitula. In the details of the florets it differs in having barbellate (not shortly plumose) pappus bristles and in having three (not two) of the corolla lobes papillose at their base, but this latter character may be a variable one. The achene of *R. nullarborensis* has a thin crustaceous pericarp with lignified radial walls while in its immature state the pericarp of *R. ascendens* shows no sign of such thickening but this may develop later.

Rhodanthe condensata (F. Mucll.) Paul G. Wilson, comb. nov.

Helipterum condensatum F. Muell., Fragm. 3:136(1863). - *Argyrocome condensata* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Murchison River, Western Australia, *A. Oldfield* (holo: MEL 110770).

Rhodanthe corymbosa (A. Gray) Paul G. Wilson, comb. nov.

Pteropogon corymbosus A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:268(1852). - *Helipterum corymbosum* (A. Gray) Benth., Fl. Austral. 3:649(1867). - *Argyrocome corymbosa* (A. Gray) Kuntze, Revis. Gen. Pl. 1:309(1891). Type citation: 'Swan river, Drummond. - Darling Range, South-west Australia, Collie.' *Isosyntype: J. Drummond* 364 (MEL 109605).

Helipterum album Ewart, J. & Proc. Roy. Soc. New South Wales 42:189(1909). *Type:* Wooroloo, Western Australia, 1906, *M.Koch* 1553 (?holo: NSW 181466; iso: PERTH).

Rhodanthe forrestii (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum forrestii F. Muell., S. Sci. Rec. 2:273(1882). - *Argyrocome forrestii* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891). Type citation: 'In the neighbourhood of the Gascoyne-River; J. Forrest.' *Lectotype* (here chosen): Gascoyne river, 1882, *J.Forrest* (lecto: MEL 50292; isolecto: K, MEL 50290, 50291, PERTH).

This species differs from *R. polycephala* in having the leaves narrowed at the base and not decurrent and in having the capitula turbinate and not narrow-cylindrical. Further collecting may show that *R. polycephala* is only a northern variant of *R. forrestii.*

Rhodanthe haigii (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum haigii F. Muell., Fragm. 10:107(1877). - *Argyrocome haigii* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Eucla, *Richards* (holo: MEL 110217; iso: PERTH).

Helipterum mullinense S. Moore, J. Linn. Soc. Bot. 45:181(1920). *Type:* Mulline, *J.E.C. Maryon* (?iso: MEL 110310).

Note. This species is similar to *R. humboldtiana* with which it was confused by Black (1957) and Haegi (1986). Apart from the presence of larger rays to the involucral bracts, *R. humboldtiana* may be readily distinguished by its silky pilose achenes for in *R. haigii* the achenes are shortly hirsute. Only *R. haigii* occurs in South Australia while both species are found in Western Australia.

Rhodanthe laevis (A. Gray) Paul G. Wilson, comb. nov.

Pteropogon laevis A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:269(1852). - *Helipterum laeve* (A. Gray) Benth., Fl. Austral. 3:649(1867). - *Argyrocome laevis* (A. Gray) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Swan River, 1843, *J. Drummond* 366 (or 356) (holo:K).

Rhodanthe nullarborensis Paul G. Wilson, sp. nov. (Figure 3)

Herba annua ad 30 cm alta, modice lanosa, aromatica. Folia caulina, alterna, linearia, plana, 10-15 mm longa, 1-1.5 mm lata, sessilia. Inflorescentia corymbiformia, compacta. Capitula homogama, breviter pedunculata. Involucrum cylindraceum vel anguste turbinatum, 3-4 mm altum, nec radians; bracteae glumaceae, 3-4-seriatae, nitidae, bracteis intermediis interioribusque oblongis, 3-4 mm longis, ad apicem rotundatis, sparse ciliatis aliter glabris. Receptaculum convexum, glabrum, c. 0.4 mm latum, bracteis receptaculi absentibus. Flosculi c. 12, bisexuales, actinomorphi. Corolla c. 3 mm longa, fere glabra, nervis ad apicem tubi extensis; lobi deltoidei, c. 1 mm longi, lobis duobus parte interiore ad basim papillosis, ceteris glabris. Antherae c. 1 mm longae; apex anguste ovatus obtusus, c. 0.3 mm longus, cellulis anguste oblongis; caudae filamentae, debiles. Styli apex truncatus, nervo prominenti ad apicem extenso. Achenium anguste obovoideum, 1 mm longum, breviter hirtellum; carpophorum annulare, glabrum; pericarpium tenuiter crustaceum, atro rubiginosum, parietibus radialibus cellularum incrassatis; testa diaphana, ad pericarpum adnata. Pappus corollam aequans, in statu integro caducae; setae c. 12, filiformae, ad basem breviter connatae, breviter plumosae.

Typus: Forrest, Western Australia, 'heavily scented, flower heads yellow', 30 Aug. 1930, *E.R.L. Johnson* 75 (holo: PERTH; iso: AD, K, MEL).

Annual erect herb to 30 cm high, branching at base, moderately and loosely woolly, strongly scented. Leaves numerous, alternate, cauline, linear, flat, 10 - 15 mm long, 1 - 1.5 mm wide, sessile. Inflorescence corymbiform, compact. Capitula homogamous, very shortly pedunculate. Involucre cylindrical to narrow-turbinate, 3-4 mm high, not radiant; bracts glumaceous, 3-4-seriate, glossy, intermediate and inner bracts oblong, 3-4 mm long, rounded at apex, sparsely ciliate, otherwise glabrous. Receptacle convex, glabrous, without receptacular bracts, c. 0.4 mm diameter. Florets c. 12, bisexual, actinomorphic. Corolla c. 3 mm long, yellow, narrow-tubular in lower half, narrow-turbinate above, glabrous or rarely very sparsely glandular puberulous, vascular strands extending to apex of tube; lobes broad-triangular, c. 1 mm long, two of the lobes papillose within at base, the others glabrous. Stamens: anther loculi c. 1 mm long; tip narrow-ovate, obtuse, c. 0.3 mm long, the cells narrow-oblong; tails filamentous, weak. Style arms truncate, papillose, the vascular strand prominent and extending to base of tip. Achene narrow-obovoid, 1.0 mm long, shortly hirtellous with duplex hairs c. 0.07 mm long, minutely bifid at tip, myxogenic; carpopodium a narrow glabrous ring; pericarp thinly crustaceous, dark reddish brown, radial cell walls thickened; testa extremely thin and fused to pericarp, the vascular strand extending to apex of seed; endosperm persistent and forming a sheath around the embryo. Pappus bristles c. 12, ± equal to corolla, very shortly united in a ring at base, shortly plumose throughout, caducous as a whole.

Distribution. Found only in the Nullarbor Region of Western Australia.

Specimens examined (selection only). WESTERN AUSTRALIA: Kanowna, *T.E.H. Aplin* 5745 (PERTH); 30 km S of Rawlinna, *R.J. Chinnock* 11262 (AD); 70 mi NNW of Reid, *A.S. George* 8491

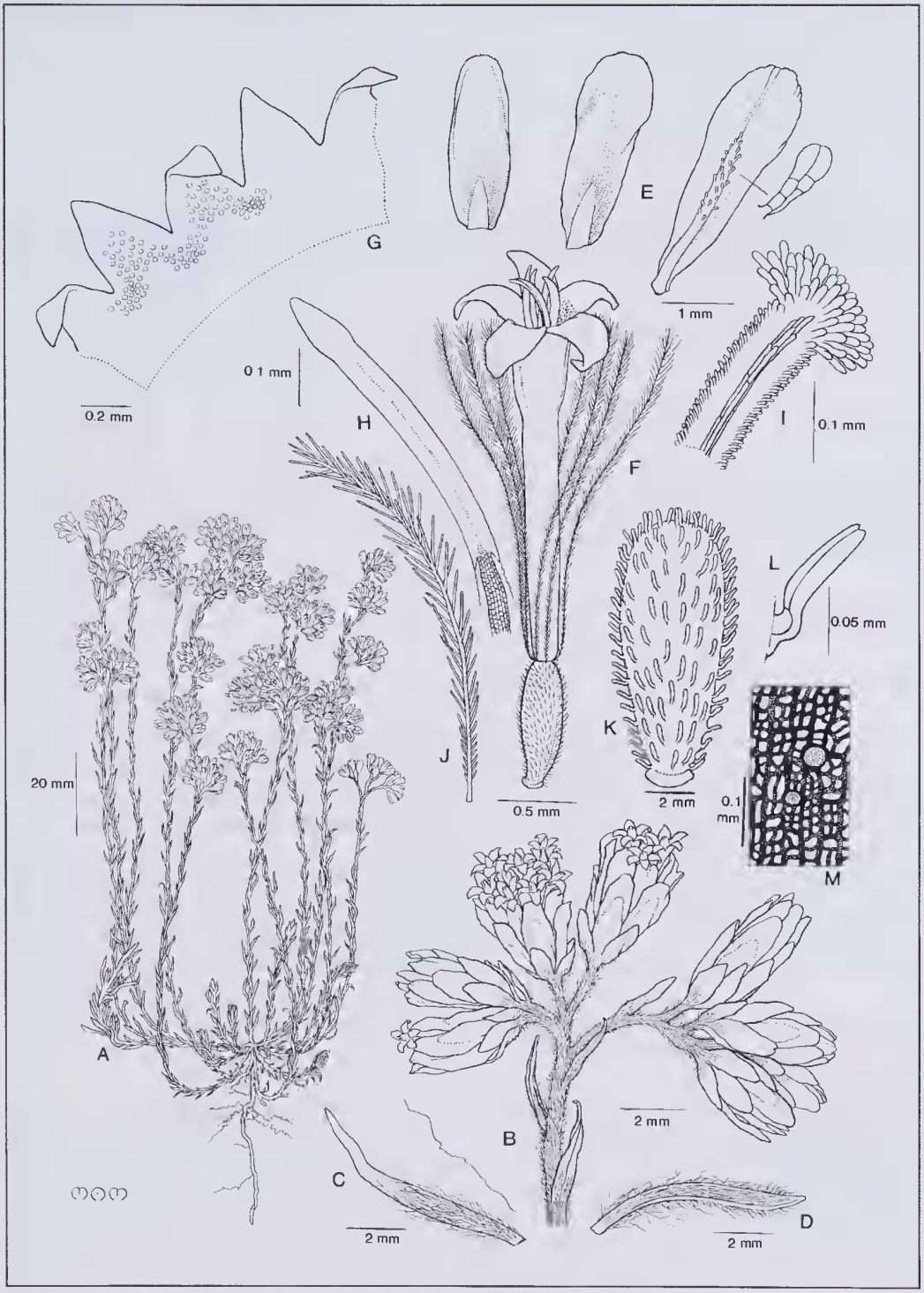

Figure 3. *Rhodanthe nullarborensis*. A - Habit. B - Terminal cluster of capitula. C - Leafy bract. D - Leaf. E - Outer, intermediate, and inner involucral bracts showing enlargement of glandular hair. F - Floret. G - Inner surface of apex of corolla indicating that only two lobes are papillose. H - Anther. I - Style apex. J - Pappus bristle. K - Achene. L - Duplex hair from achene. M - Surface of pericarp. From *G.J. Keighery* 7623.

(PERTH); 17 km NW of Koonjarra, *D.W. Goodall* 2511 (PERTH); 49 km NNE of Balladonia, *G.J. Keighery* 7623 (PERTH).

Habitat. In shallow open depressions (dongas) that have a layer of heavy soil over limestone.

Flowering time. July to October.

Rhodanthe nullarborensis resembles *H. tietkensii* with which it has been confused in herbaria. The latter species may be recognised by its larger leaves, its larger and more hairy capitula, and by the presence of receptacular bracts.

Johnson & Baird (1970) in referring to this species as *Helipterum tietkensii* state that it is heavily scented and that it forms dense colonies in the dongas.

Rhodanthe polycephala (A. Gray) Paul G. Wilson, comb. nov.

Pteropogon polycephalus A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:268(1852). - *Helipterum polycephalum* (A. Gray) Benth., Fl. Austral. 3:649(1867). - *Argyrocome polycephala* (A.Gray) Kuntze, Revis. Gen. Pl. 1:309(1891). Type citation: 'Swan river, Drummond', *n.v.*

Cassinia cuprea F. Muell., Fragm. 3:139(1863). *Lectotype* (here chosen): Near the Murchison, *A. Oldfield* (MEL 110308).

Rhodanthe psammophila Paul G. Wilson, sp. nov. (Figure 4)

Herba erecta ad 40 cm alta. Folia caulina alterna, anguste oblonga vel linearia, ad 6 cm longa, sessilia, parce decurrentia, lanata et minute stipitato-glandulosa. Capitula heterogama, sessilia, glomerata. Involucrum anguste turbinatum, c. 4 mm altum; bracteae 4-6-seriatae, obovatae, 3-4 mm longae, apice albo, rotundato, margine eroso; unguis bractearum interiorum dense lanato- ciliatus. Flosculi semper quinque, uno fertili, quatuor masculinis. Corolla actinomorpha, sparse puberula; lobi intra papillosi. Achenium compresso-obovoideum, c. 2.5 mm longum, sparse et minute puberulum; carpophorum annulare; pericarpium tenuiter crustaceum; testa membranacea pericarpium adnata. Pappus achenii fertile tarde deciduus; setae c. 13, anguste lineares, acuminatae, c. 2.0 mm longae, sparse ciliatae pilis gracilibus acuminatis. Achenium bracteis interioribus consociatis deciduum.

Typus: Western Australia, 20 km north of Carnarvon, red sand dune, 25 September 1987, *Paul G. Wilson* 12604 (holo: PERTH; iso: AD, CANB, K, MEL, NSW, S).

Erect shortly woolly annual branching at and above base, to 40 cm high. Leaves cauline, alternate, narrow-oblong to linear, acuminate, to 6 cm long, sessile, slightly decurrent along the margins, woolly all over and with minute shortly stipitate reddish brown globular glands. Capitula heterogamous, sessile in dense clusters, these shortly stipitate forming subglobular heads on slender peduncles 1-3 cm long. Involucre narrow-turbinate, c. 4 mm high; bracts 6-seriate, obovate, 3-4 mm long, rounded at apex, hyaline in lower 2/3, white petaloid (with flat cells) and wrinkled above with erose margin; claw of inner bracts densely long woolly ciliate on margin, the wool enveloping the ovaries; stereome linear, hard, green, slightly shorter than claw, passing downwards into a very short hard stipe. Receptacle hemispherical, c. 3 mm high and wide, glabrous, smooth. Florets consistently 5 only one

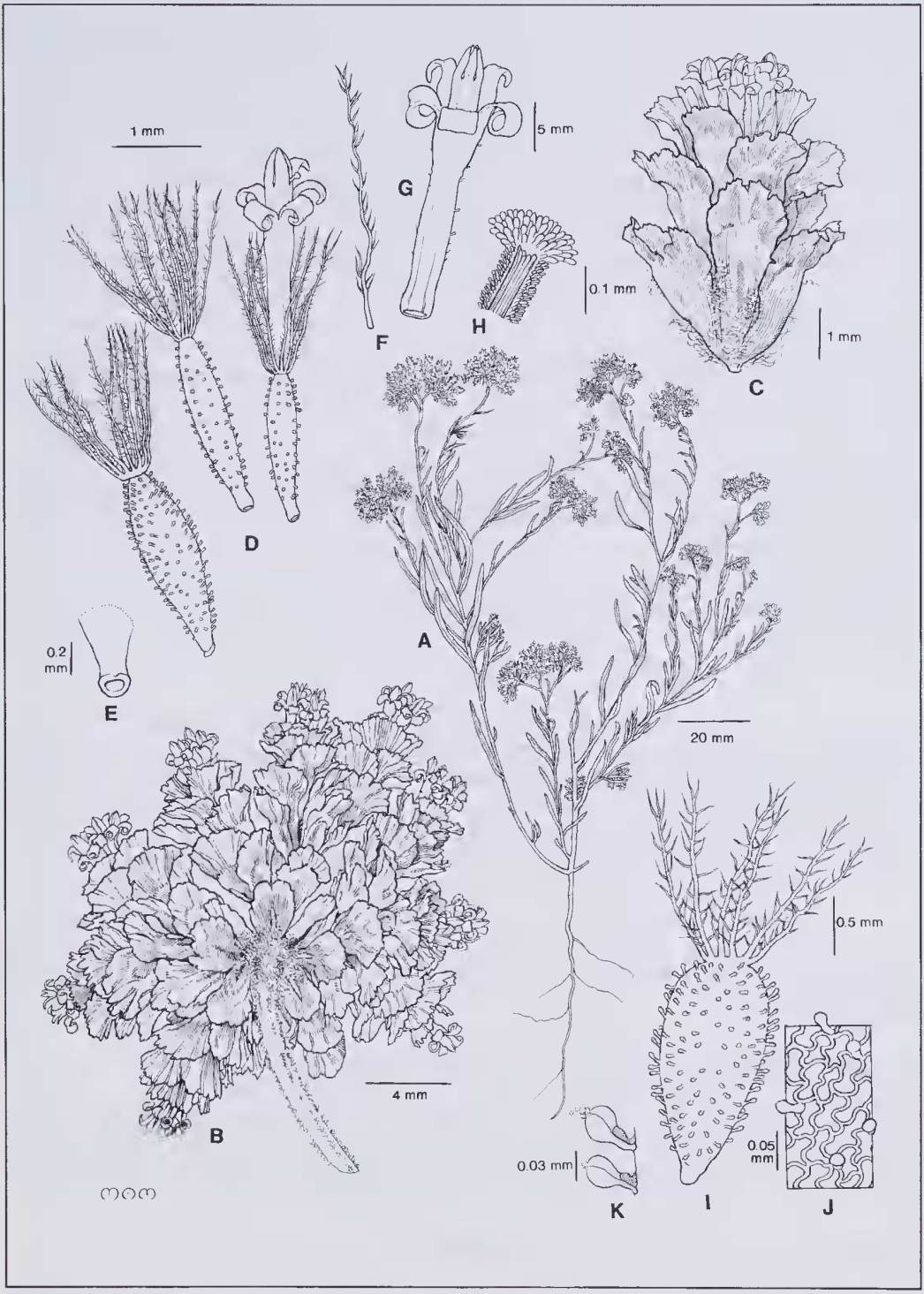

Figure 4. *Rhodanthe psammophila*. A - Habit. B - Cluster of capitula. C - Capitulum. D - Florets with and without corolla. E - Carpopodium. F - Pappus bristle. G - Corolla. H - Style apex. I - Achene with pappus. J - Pericarp. K - Duplex myxogenic achenial hairs. From *Paul G. Wilson* 12604.

of which is bisexual, the others male. Corolla actinomorphic, yellow, tube c. 2.5 mm long, sparsely puberulous, narrow-tubular below, narrow-turbinate above; lobes oblong, obtuse, c. 0.5 mm long, the vascular strands extending to tips, all papillose within along entire length. Stamens: anther loculi c. 1 mm long; appendage ovate with narrow-oblong cells, the marginal ones smaller and equilateral; tails weak, slightly exceeding collar. Style apex truncate, penicillate, the vascular strand extending to apex. Achene compressed obovoid, c. 2.5 mm long, sparsely and minutely puberulous with blunt duplex hairs c. 0.06 mm long; carpopodium a very short glabrous ring; pericarp thinly crustaceous, pale reddish brown, the cells of epidermis amoeboid, thickened on radial walls; testa membranous, vascular strand beneath a pericarpial strand and passing over apex of seed; endosperm persistent around embryo. Pappus (of fertile achene) tardily deciduous; bristles c. 13, narrow-linear, acuminate, c. 2.0 mm long, sparsely ciliate with slender acuminate hairs. Achene deciduous along with inner involucral bracts.

Distribution. Western Australia, near the coast between Carnarvon and Onslow, and inland to the Kennedy Range.

Specimens seen (selection only). WESTERN AUSTRALIA: Kennedy Range, *R.J. Cranfield* 1913 (PERTH); 10 mi S of Onslow, *A.S. George* 1150 (PERTH); southern margins of Lake McLeod, *P.S. Short* 2491(MEL); 12 mi NW of Mt Sandiman, *B.L. Turner* 5401 (PERTH); Brown Range, *B.L. Turner* 5411 (PERTH).

Habitat. Grows only on sand dunes, both inland and coastal.

Chromosome number: n = 5 *fide* B.L. Turner (1970) as *Helipterum condensatum.*

Rhodanthe psammophila is superficially similar to *R. condensata* with which it has been confused in herbaria. The latter species may be distinguished by the absence of glandular hairs on the leaves, by the presence of 10-13 florets to a capitulum, and by the persistent pappus. The cells of the white lamina of the involucral bracts of *R. condensata* are raised at their tips giving it a slightly rough surface whereas in *R. psammophila* the lamina is smooth. *Rhodanthe condensata* is found from Shark Bay south to the Murchison River which is south of the distribution of *R. psammophila.*

The relationships of this species are unclear. In some ways, such as in the structure of the floret, it is similar to *Rhodanthe maryonii*, but it differs from that species in having a caducous achene and a 1-celled thick crustaceous pericarp (characters that, in this context, may be of little phyllogenetic significance).

Rhodanthe tietkensii (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum tietkensii F. Muell., Fragm., 8:227(1874). - *Argyrocome tietkensii* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891). *Type:* Between the Alberga and Mt Olga, 1873/4, *E. Giles* (holo: MEL 110506).

5. Rhodanthe sect. **Citrinae** Paul G. Wilson, sect. nov.

Herba annua erecta sparse lanosa, non glandulosa. Folia caulina alterna linearia vel anguste oblonga. Capitula homogama vel heterogama, terminalia. Involucrum radians; bracteae multiseriatae, omnes chartaceae et petaloidcae, exteriores sessiles, interiores unguiculatae; unguis oblongus vel

elliptieus, hyalinus, lanato-ciliatus, stereomate lineari applanato. Reeeptaeulum glabrum, planum. Floseuli numerosi, homomorphi, actinomorphi, extra feminei vel bisexuales, intra bisexuales. Corolla infra tubulosa supra anguste turbinata, 4-5-loba, sparse pilosa; lobi glabri, intra laeves. Antherae: appendix anguste ovatus, tenuis, eellulis oblongis parietibus tenuibus; eaudae filamentosae. Styli apex truneatus. Achenium anguste ellipsoideum, c. 1 mm longum, plerumque in rostrum glabrum attenuatum, breviter pilosum, pilis myxogeneis; pericarpium debile, eellulis epidermidis ± eubieis, parietibus tenuibus; testa chartacea, pallido brunea ad periearpio affixa, crystallis applanatis munitis. Pappi setae imo basi eonnatae, breviter plumosae vel denticulatae, caducae.

Holotypus: Rhodanthe citrina (Benth.) Paul G. Wilson

Annual erect herbs, sparsely woolly, not gland dotted. Leaves cauline, alternate, linear or narrow-oblong. Capitula homogamous or heterogamous, terminal. Involuere radiant; bracts multiseriate, all glumaceous and petaloid, outer sessile, the inner with an oblong or elliptie hyaline woolly eiliate claw. Receptacle glabrous, flat. Florets numerous, homomorphous, regular, the outer female or bisexual, the inner bisexual. Corolla tubular below, narrow-turbinate above, 4-5-lobed, sparsely pilose; lobes glabrous, smooth within. Anther appendix narrow-ovate, e. 0.2 mm long, thin, eells oblong with thin walls; tails filamentose. Style apex truncate. Achene narrow-ellipsoid, e. 1 mm long, frequently narrowed at apex into a beak; shortly pilose with duplex myxogenie hairs; pericarp with epidermis of thin-walled cubical cells, other tissue flattened and ineonspicuous, vascular strands lateral (slightly oblique); testa papery, pale brown, adnate to periearp, sparsely furnished with broad, flat crystals or these absent when mature, vaseular strand ascending to apex and adjaeent to a pericarpial strand. Pappus eadueous; setae eonnate into a ring at base, shortly plumose or barbellate.

Rhodanthe citrina (Benth.) Paul G. Wilson, comb. nov.

Leptorhynchos citrinus Benth. in Endl. *et al.*, Enum. Pl. Hueg. 64(1837). *Waitzia citrina* (Benth.) Steetz in Lehm., Pl. Preiss. 1:454(1845). Type citation: 'Swan-River. (Hügel.).'*n.v.*

Waitzia brevirostris Steetz in Lehm., *op.cit.* 1:451(1845). *Type:* In arenosis sylvae supra urbiculam "Perth", 7 Oct.1839, *L. Preiss* 15. *Lectotype* (here ehosen): MEL 1585201; isolecto: LD, MEL 1585197.

Waitzia sulphurea Steetz in Lehm., *op.cit.* 1:4553(1845). *Lectotype* (here ehosen): In arenosis inter frutiees prope urbiculam "Guildford", 14 Oct.1839, *L. Preiss* 7 (leeto: MEL 1585196; isoleeto: LD).

Waitzia steetziana Lehm., *op.cit.* 1:454(1845). - *Waitzia tenella* Hook., Bot. Mag. t.5342(1862) *nom.illeg. Type:* In solo limoso sylvae prope praedium rusticum "Maddington", 31 Oct.1839, *L. Preiss* 6 (syntypes and isosyntypes: LD, MEL 1585194, 1585195, 1585198).

Waitzia dasycarpa Turcz., Bull. Soc. Imp. Naturalistes Moseou 24/2:77(1851). *Type:* Swan River Colony, *J. Drummond* 5th coll. no. 65 (holo: KW photo seen; iso: PERTH).

Helichrysum oldfieldii F.Muell., Fragm. 3:134-135(1863). *Lectotype* (here chosen): Murchison River, *A. Oldfield* (MEL 108299).

Distribution. Western Australia south of 22° lat., southern Northern Territory, northern South Australia, north western New South Wales.

Note: The genus *Waitzia*, as previously circumscribed, was an unnatural assemblage of species in the *Helipterum* complex that had in common a beak-like apex to the achene. In the strict sense (see Wilson 1992b) *Waitzia* contains species with the following characters: stipe-like claws to the involucral bracts, tooth-like papillae (that consist of 2 overtopping cells) on the achenes, and ellipsoid apices to the styles. In *Rhodanthe citrina* the inner involucral bracts have flattened scarious claws, the achenes have normal slender duplex hairs, and the style apices are truncate; it is thus distinct from *Waitzia* but similar to some species of *Rhodanthe* sect. *Achyroclinoides*. The section *Citrinae* differs from sect. *Achyroclinoides* principally in the nature of the involucral bracts which are all scarious and petaloid, the outer sessile and the inner stipitate on a broad hyaline ciliate claw; none of them is radiant. The appearance of the capitula is similar to that found in some species of *Chrysocephalum* (*Helichrysum* sect. *Chrysocephalum*), such as *Chrysocephalum apiculatum* (Labill.) Steetz, and the two species are sometimes confused.

In *Rhodanthe citrina* the rostrum to the achene is variable in length and in some specimens is completely absent; that organ, in any event, does not seem to be necessarily of generic significance since it merely represents an upwards extension of the pericarp.

It has been shown by Warcup (1990) that *Waitzia citrina* forms ectomycorrhizal associations whereas other *Rhodanthe* species that have been tested do not. It is possible that the seed with which Warcup worked was either *Hyalosperma cotula* (Benth.) Paul G. Wilson or *Chrysocephalum apiculatum*, both of these form ectomycorrhiza and both resemble *W. citrina*. No voucher material can be traced.

Two other species previously placed in *Waitzia*, i.e. *W. paniculata* (Steetz) Benth. and *W. conica* B.Turner, are also anomalous in that genus and are here transferred to *Pterochaeta* and *Haptotrichion* respectively.

6. Rhodanthe sect. **Synachyrum** (A. Gray) Paul G. Wilson, comb. nov.

Helipterum sect. *Synachyrum* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:231(1852). *Type: Helipterum floribundum* DC.

[*Helipterum* sect. *Sericophorum* DC., Prod. 6:216(1838) *p.p. min.* excluding lectotype.]

Plants cottony. Intermediate involucral bracts with thick narrow-oblong stereome not extending into lamina; cottony. Corolla with vascular strands not extending to tips of lobes. Style apex truncate. Achene densely silky; carpopodium absent; pericarp thinly coriaceous or papery; testa weak, free from pericarp, containing oblong imbricate crystals that form a complete cover to seed (see Figure 5). Pappus bristles narrow-oblong and sometimes partially united into a tube at base, caducous.

Rhodanthe floribunda (DC.) Paul G. Wilson, comb. nov. (Figure 5)

Helipterum floribundum DC., Prod. 6:217(1838). *Type:* Barren forests at the foot of Peel's Range, Interior of N.S.Wales, June 1817, *A.Cunningham* 107 (holo: G-DC photo seen).

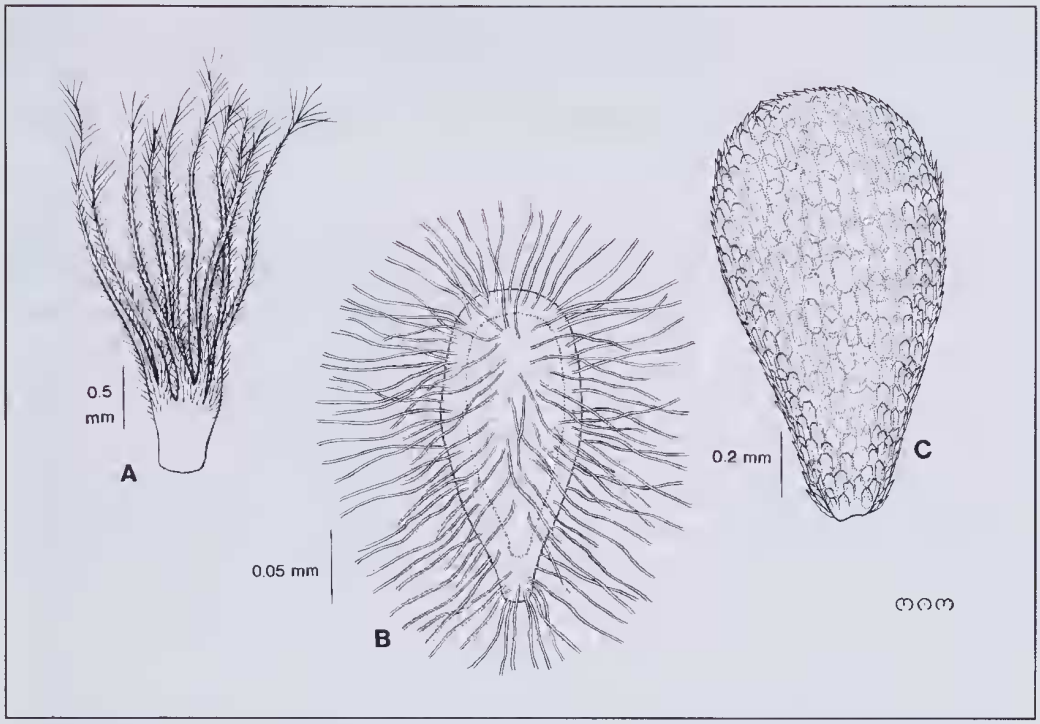

Figure 5. *Rhodanthe floribunda.* A - Pappus. B - Achene. C - Testa with imbricate scale-like crystals.

Helipterum chionolepis F. Muell., Linnaea 25:416(1853). Type citation: 'Juxta montes Flinders-range et Cudnaka locis sterilibus.' *Lectotype* (here chosen): MEL 110120 with labels 'Cudnaka' and 'Prope montis Flinders range, Oct.51' *leg. F.Mueller; syntype:* Cudnaka, *F.Mueller* (MEL 604828).

Helipterum cirratum Morrison, J.Bot. 50:168(1912). *Type:* Between Globe Hill and Uaroo, Ashburton River, 1 Oct. 1905, *A.Morrison* (? iso: PERTH).

Helipterum floribundum var. *tubulipappum* J. Black, Trans. & Proc. Roy. Soc. South Australia 36:23 t.2(1912). *Type:* Oodnadatta, Sept.1911, *F.C. Staer* per Mrs Mellor (holo: AD 98625088 *p.p.*).

Rhodanthe sphaerocephala Paul G. Wilson, sp. nov.

Annua erecta ad 25 cm alta. Rami lanosi, omnino foliacei. Folia alterna sessilia, angustissimo oblonga, c. 10 mm longa, sparse lanosa. Capitula homogama, solitaria, terminalia, sphacroidea, c. 10 mm diam. Bracteae involucri multi-seriatae, aliquantum corrugatae, nitidae. Bracteae intermediae in ambito obovatae, c. 5 mm longae; unguis latissime oblongus, hyalinus; stereoma spatulatum, parte terminali incrassata et dense lanosa; lamina late elliptica, integra, straminea. Receptaculum conicum, tuberculatum. Flosculi numerosi, bisexuales, actinomorphi. Corolla c. 4 mm longa, glabra; lobi 5, anguste oblongi, c. 1.5 mm longi, intra laeves; nervi corollae ad apice tubi extensi. Antherae: appendix sterilis ovata, acuta, c. 0.6 mm longa, cellulis oblongis, parietibus nec incrassatis; caudis filamentis debiles. Styli apex truncatus, nervo prominenti ad basem apicis extenso. Achenium ellipsoideum c. 2 mm longum, dense sericeum, pilis in lobos inaequales terminantibus; pericarpum membranaceum, translucens; testa tenuiter coriacea, pallide brunea, cellulis crystallis oblongis

repletis. Pappi setae librae, caducae, in parte inferiore angusto ellipticae, breviter plumosae, in parte superiore filiformae, sparse plumosae, ad extremum plumoso-penicillatae.

Typus: Belele Station, c. 56 km WNW of Meekatharra, Western Australia, 30 Oct. 1965, *D.W. Goodall* 3366 (holo: PERTH; iso: CANB).

Erect annual to 25 cm high branching at and shortly above base. Stems loosely woolly, leafy throughout. Leaves cauline, alternate, sessile, very narrow-oblong, c. 10 mm long, 1 mm wide, sparsely woolly with crinkly hairs. Capitula homogamous, solitary, terminal to long branches, almost spherical, c. 10 mm diameter. Involucral bracts multi-seriate, somewhat crinkly, glossy, straw-coloured, similar throughout; intermediate bracts obovate in outline, c. 5 mm long; claw very broad-oblong, hyaline, woolly ciliate on distal margins, stereome spatulate with the terminal portion thickened and bearing a dense tuft of wool on abaxial surface, lamina broad-elliptic, entire, somewhat wrinkled, glabrous, glossy, straw-coloured. Receptacle ovoid, c. 3 mm high, 2.5 mm wide, glabrous, tuberculate with raised achenial scars. Florets numerous, homogamous, bisexual, actinomorphic. Corolla c. 4 mm long to base of lobes; tube narrow-cylindrical, glabrous; limb narrow-campanulate, glabrous; lobes 5, narrow-oblong, c. 1.5 mm long with a few glandular hairs (with large oblongoid terminal cells) on abaxial side, smooth within, vascular strands reaching to base of lobes. Anther appendage ovate, acute, c. 0.6 mm long, cells oblong with unthickened walls, marginal cells not differentiated; anther tails filamentous, weak. Style tip truncate, shortly penicillate, the vascular strand stout, not extending into apex. Achene ellipsoidal, c. 2 mm long, densely long-silky to base, the duplex hairs terminating in two very uneven arms with one very short (c. 0.005-0.01 mm) and the other long (c. 0.3 mm), not myxogenic; pericarp thin, translucent; testa thinly coriaceous, pale brown, the outer cells filled with flat broad-oblong crystals that form an armour-like covering to seed. Pappus bristles slightly shorter than corolla, free, caducous, linear-elliptic and shortly plumose in lower half, filiform and sparsely plumose in upper half, plumose tufted at end.

This species is known only from the type collection for which ecological information is not available.

Rhodanthe sphaerocephala would appear to have no close relative but the morphology of its florets and fruits suggests affinity to other members of the section *Synachyrum*.

Rhodanthe sterilescens (F. Muell.) Paul Wilson, comb. nov.

Helipterum sterilescens F. Muell., S. Sci. Rec. 2:274(1882). - *Argyrocome sterilescens* (F. Muell.) O. Kuntze, Rev. Gen. Pl. 1: 309 (1891). *Type:* Gascoyne River, W.A., 1882, *Pollack* (holo: MEL 110428; iso: PERTH).

This species bears dense clusters of capitula that give it a similar appearance to *Cephalipterum drummondii* with which it has been frequently confused.

Rhodanthe sterilescens differs from *C. drummondii* in the following significant characters: sessile capitula at base of plant in addition to terminal (not all terminal); capitula in a compact cyme (not dense umbel); indumentum woolly (not of curled filiform hairs with septate base and glandular stipitate hairs); achenial hairs slender of the normal duplex type (not clavate helically coiled and

barbed woolly); achenes free, three fertile and silky, the rest sterile and glabrous (not coalescent with 1 or two fertile and the remainder sterile but hairy); achene narrowed at apex (not broad and lobed at apex). The two species are similar in floral characters, in the seed morphology, and in form of the crystals present in the testa.

Rhodanthe stuartiana (Sond. & F. Muell.) Paul G. Wilson, comb. nov.

Helipterum stuartianum Sond. & F. Muell., Linnaea 25: 518 (1853). - *Helipterum floribundum* var. *stuartianum* (Sond. & F. Muell.) Benth., Fl. Austral. 3:642(1867). Type citation: 'Ad fl. Murray leg. Stuart.' *Lectotype* (here chosen): Ad fl. Murray, *F. Mueller* (MEL 604830).

The type of *Helipterum stuartianum* is stated to have been collected by Stuart. A herbarium O.W. Sonder specimen (MEL 604830) labelled 'Ad fl. Murray' was collected by F. Mueller and bears in (?)Sonder's handwriting the phrase 'Antherae basi bisetae'; these words are used in the published description. A further collection from 'Near the Murray R.' no. 785 (MEL 1539201) was evidently from Stuart. It bears the note 'This plant did not occur in my collection at Adelaide but I found seed of it amongst those you procured from Stephens' [? William Stephens, a garden's collector]. I have selected the Mueller collection (MEL 604830) as the lectotype since it was evidently studied by Sonder.

Rhodanthe troedelii (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum troedelii F. Muell., Victorian Naturalist 7:77(1890). Type citation: 'Near the Barrier-Ranges; Mrs Irvine, at Leight's Creeks, beyond Beltana; Mrs Richards.' *Lectotype* (here chosen): Leigh's Creek, 1887, *Mrs Richards* (lecto: MEL 110636; isolecto: MEL 696324, NSW 181421).

Helipterum troedelii var. *patens* Ewart, J. White & B. Rees, Proc. Roy. Soc. Victoria 22 n.s.:15(1909) *pro parte* as to lectotype. - *H. roseum* var. *patens* (Ewart *et al.*) J. Black, Trans. & Proc. Roy. Soc. South Australia 45:21(1921). Type citation: 'Mt. Lyndhurst, M. Koch, No.1644 (1899); Fraser Range, W. Austr., R. Helms, 1891.' *Lectotype:* Mt Lyndhurst, S. Australia, *M. Koch* 1644 (1899), AD 97650128, *fide* D. Cooke in Jessop & Toelken, Fl. South Australia edn 4, 1549(1986).

The syntype material of *H. troedelii* var. *patens* consists of two species. The collection of Max Koch represents *Rhodanthe troedelii* while the collection of R. Helms represents the 'Nullarbor' variant of *R. chlorocephala*. J.M. Black (1921 *l.c.*) indicated that he had examined duplicate material of the Helms syntype and recognised it as being a variant of *Helipterum roseum*, he therefore transferred var. *patens* to that species (which is a synonym of *Rhodanthe chlorocephala*). However, D. Cooke (1986 *l.c.*) lectotypified the name on a Max Koch collection in herb. AD which had been received by Black as a donation from MEL and is probably a duplicate of the Max Koch syntype (it does not bear the month of collection that is present on the syntype). The AD specimen had been annotated by Ewart as 'typical *H. Troedelii*'. In herb. MEL the Max Koch syntype has had the epithet 'var. *patens*' deleted, presumably by Ewart, while the Helms syntype has been labelled 'type'. It would therefore appear that subsequent to its publication Ewart intended to apply the epithet var. *patens* to the element represented by the Helms collection which was also the way in which Black applied the name (as a synonym of *H. roseum*) in 1921 and in the Flora of South Australia (1929).

7. Rhodanthe sect. **Helipteridium** (A. Gray) Paul G. Wilson, comb. nov.

Helipterum sect. *Helipteridium* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:231(1852). *Type: Helipterum discoideum* A. Gray

Helipterum sect. *Aglossum* F. Muell., Fragm. 3:137(1863) *nomen.*

Annual erect herb, sparsely woolly with filiform hairs, and with curled uniseriate septate hairs, eglandular. Major axes slender. Leaves alternate, flat, sessile. Capitula heterogamous, solitary, terminal. Involucre hemispherical, not radiant. Receptacle glabrous with prominent alveolae. Involucral bracts c. 4-seriate, glabrous, glossy, uniform; claw broad-oblong with a broad herbaceous stereome and narrow scarious margins; lamina short, erect, scarious. Florets bisexual or the inner male. Corolla slightly zygomorphic; tube cylindrical, pubescent with gland-tipped hairs; throat turbinate, glabrous; lobes 5, unequal, papillose within, vascular strands extending to apex of lobes. Anther appendix deltoid, cells short and irregular; anther tails filamentous, weak. Style apex truncate with a subulate coalescence of epidermal cells in the centre. Achene ellipsoid, silky pilose with normal duplex hairs; carpopodium annular; pericarp brittle; testa soft with numerous oblong crystals, lower 2/3 surrounded by a network of vascular strands. Pappus bristles linear-acuminate, plumose.

A monotypic section.

Rhodanthe heterantha (Turcz.) Paul G. Wilson, comb. nov.

Helipterum heteranthum Turcz., Bull. Soc. Nat. Mosc. 24/1 :198 (1851). *Type:* Nova Hollandia, *J. Drummon*d 4th coll. n.214 (holo: KW photo seen; iso: K, MEL 110231, 110233).

Helipterum discoideum A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:231(1852). Type citation: 'Variat *a*, involucro pallido; ß, involucro sanguineo. Swan River (ß, Swan River to King George's Sound), Drummond.' (*syn:* K 'J. Drummond 96', photo seen).

Helipterum anactinum F. Muell., Fragm.3:137(1863). Type citation: 'Ad sinum orarium Champion Bay. Walcott et Oldfield.' *Lectotype* (here chosen): Champion Bay, *A. Oldfield* (lecto: MEL 110229).

Helipterum heteranthum var. *majus* Benth., Fl. Austral. 3:643(1867). *Type:* Between Moore and Murchison rivers, *J. Drummond* 6th coll. n.152 (holo: K; iso: MEL 110226, NSW).

Helipterum pachychaetum W.Fitzg., J. W. Austral. Nat. Hist. Soc. No.2:25(May 1905). *Lectotype* (here chosen): Jacup, 50 miles west of Phillips River, Oct.1903, *C.R.P. Andrews* (lecto: PERTH; isolecto: NSW).

Helipterum heteranthum var. *minor* Ewart, J. White & Tovey, J. Roy. Soc. N.S.Wales 42:190(1908). *Lectotype* (here chosen): Cowcowing, W.A., Oct.1904, *M. Koch* 1108 (lecto: MEL 110220; isolecto: MEL 110221).

8. Rhodanthe sect. **Helichrysoides** (A. Gray) Paul G. Wilson, comb. nov.

Pteropogon sect. *Helichrysoides* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:267(1852). *Type: Pteropogon spicatus* Steetz

Annual erect herbs, woolly or glandular puberulous. Leaves cauline, alternate, filiform to obovate. Capitula homogamous or heterogamous, clustered, paniculate or condensed in spike-like inflorescences. Involucre turbinate to cylindrical, not radiant; bracts multiseriate, glabrous or glandular pubescent, scarious or with herbaceous tips; stereome small, basal. Receptacle convex to broad-conical, glabrous or scabrid. Florets 5-30, bisexual, or the innermost male. Corolla actinomorhpic , sparsely puberulous, narrow-cylindrical below, narrow-campanulate above; lobes ovate, papillose or smooth within, vascular strands extending to tips. Stamens: anther apex ovate the distal cells slightly raised at tip; tails filamentous, weak. Style apex broad to narrow-deltoid, puberulous, vascular strand extending to tip. Achene narrow-obovoid to narrow-turbinate, pilose almost to base; carpopodium an extremely short ring; pericarp rough, thick, brittle, dark brown; testa free from pericarp, membranous, vascular strand extending almost completely around seed; crystals absent. Pappus persistent; bristles thick at base, plumose, the cilia all acute.

The section *Helichrysoides* is similar to sect. *Leiochrysum* but differs in the nature of the involucral bracts (foliaceous at apex except in *R. spicata*), the presence of vascular strands at the apex of the corolla lobes, the deltoid style apex, and the thick brittle pericarp. It is also similar to species in the genus *Podotheca* in the morphology of the achene, the deltoid style apex, and the foliaceous apex to the involucral bracts. In the latter genus the chromosome number is n=13, 26 (Short 1989) whereas in *Rhodanthe* sect. *Helichrysoides* the three species *R. battii*, *R. pollackii*, and *R. spicata*, have a chromosome number of n = 10 (B. Turner *in sched.*); the number for *R. charsleyae* has not been recorded. Warcup (1990) has shown that *R. battii* and *R. spicata* do not form ectomycorrhiza whereas species of *Podotheca* that have been tested do; this again suggests that the species in sect. *Helichrysoides* should not be placed in *Podotheca*.

Rhodanthe battii (F. Muell.) Paul. G. Wilson, comb. nov.

Helipterum battii F.Muell., Victorian Naturalist 10:144(1893). *Type:* Between Dundas-Hills and Lake-Lefroy, 1893, *J.D. Batt* (holo: MEL 110727).

[*Podotheca pollackii* auct. non (F.Muell.) Diels: Diels & Pritzel, Bot. Jahrb. Syst. 35:615-623(1905) as to specimen cited and description.]

Rhodanthe pollackii (F. Muell.) Paul G. Wilson, comb. nov.

Podosperma pollackii F. Muell., Fragm. 12:21(1882); - *Podotheca pollackii* (F. Muell.) Diels, Bot. Jahrb. Syst. 35:617(1905). Type citation: 'In vicinia fluminis Gascoyne-River; Forrest et Pollack.' *Syntype:* Gascoyne River, 1882, *J. Forrest* (PERTH).

Rhodanthe charsleyae (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum charsleyae F. Muell., Fragm. 8:168(1874). Type citation:'In vicinia lacus Amadei, Giles; prope lacum Lefroyi, Forrest.' *Lectotype* (here chosen): Lake Lefroy, State Well, *A. Forrest* (MEL 110714).

Rhodanthe spicata (Steetz) Paul G. Wilson, comb. nov.

Pteropogon spicatus Steetz in Lehm., Pl.Preiss. 1:479(1845); A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:268(1852). - *Helipterum spicatum* (Steetz) Benth., Fl. Austral. 3:647(1867). Type citation:

'In limoso-calculosis illustribus lateris orientalis montis Lehmann', 4 Sept.1839, *L. Preiss* 24. *Lectotype* (here chosen): MEL 110492; isolecto MEL 110493, MEL 604832.

Helipterum monencyanthoides F. Muell., Fragm. 3:137(1863). - *H. spicatum* var. *pallens* Benth., Fl. Austral. 3:648(1867). Type citation: 'Ad rivos Tom [i.e. Tone] River et Salt River', *G.Maxwell*. *Lectotype* (here chosen): Banks and valleys of Salt River, *G.Maxwell* 75 (MEL 110707).

Calocephalus globosus M.Scott & Hutch., Kew Bull. 1916:36(1916). *Type:* Kauring, on York - Greenhills line, Western Australia, *F. Stoward* 505 (holo: K photo seen).

9. Rhodanthe sect. **Actinaria** Paul G. Wilson, sect. nov.

Herba annua erecta sparse glanduloso puberula. Folia caulina, alterna, applanata. Capitula homogama, solitaria, terminalia. Involucrum cupulatum ad hemisphaericum, radians; bracteae manifeste dimorphae, multiseriatae; bractea exteriora anguste linearia, acuminata, glanduloso puberula; bracteae interiores ungue anguste oblongo, lamina ovata, petaloidea. Receptaculum pulvinatum, glabrum, laeve. Flosculi numerosi, bisexuales, homomorphi, actinomorphi. Corolla infra tubulosa supra anguste turbinata, pallido flava, 5-loba; lobi glabri, extra sparse pilosi, intra laeves. Antherae: appendix anguste ovatus, cellulis anguste oblongis parietibus tenuibus; caudae parte proximali firmae, parte distali filamentosae debiles. Styli apex ellipsoideus, nervo carenti. Achenium cylindraceum, c. 1 mm longum, modice pilosum, pilorum longitudine dissimili (0.02-0.2 mm); carpophorum annulare; pericarpium unicellulam crassum, crustaceum; testa membranacea, unicellulam crassum, translucens, crystallis carentibus. Pappi setae filiformes,imo basi connatae, in statu integro caducae, breviter plumosae.

Typus: Rhodanthe margarethae (F. Muell.) Paul G. Wilson

Erect annual herbs, branched, sparsely glandular puberulous. Branches slender, reddish. Leaves cauline, alternate, thin. Capitula homogamous, solitary, terminal to branches. Involucre cup-shaped to hemispherical, c. 2 cm diameter, radiant; bracts distinctly dimorphic; outer bracts narrow-linear, acuminate, c. 4 mm long, glandular puberulous; inner bracts with erect narrow-oblong woolly ciliate claw and spreading ovate petaloid white or pale yellow lamina, the stereome narrow-oblong, thick and glandular puberulous. Receptacle cushion-shaped, c. 5 mm diameter, smooth, papillose around alveolae. Florets numerous, bisexual, 5-merous, actinomorphic. Corolla narrow-tubular below, expanded above, pale yellow, very sparsely puberulous outside, lobes smooth within, cells of inner epidermis of lobes oblong. Stamens: anther tip narrow-ovate acute, cells narrow-oblong, the marginal cells forming an indeterminate row; anther tails firm, equal to collar. Style apex elliptic, shortly papillose, without vasculature. Achene cylindrical c. 1 mm long, moderately short pilose, hairs rounded at apex and of different lengths (0.02-0.2 mm); carpopodium a short glabrous ring; pericarp thin and crustaceous, brown; testa thin, translucent, without crystals. Pappus caducous as a whole; bristles filiform, shortly plumose throughout, connate in ring at base.

A section of two morphologically similar species that are restricted in their distribution to the northwestern region of Western Australia.

The section *Actinaria* differs from other members of the *Rhodanthe* complex in having narrow-linear outer involucral bracts, elliptic style apices that are without vasculature, filiform pappus bristles, and short blunt achenial hairs that are of different lengths. The habit of the two included

species is similar to that of *R. manglesii* in section *Rhodanthe*, as was noted by Mueller in his description of *H. margarethae*, but in floral characters the sections are very distinct.

Rhodanthe margarethae (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum margarethae F. Muell., Fragm. 11:48(1878); F. Muell., Syst. Census Austral. Pl. 80(1882) *'Margaritae'*; F. Muell., Sec. Syst. Census Austral. Pl. 136(1889) *'Margaritae'*; Domin, Biblioth. Bot. 89:667(1929); *Argyrocome margarethae* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891) *'Margaritae'*. Type citation:'Ad amnem Jones's Creek et flumen George's River prope Nickol-Bay; J. Forrest'. *Lectotype* (here chosen): Jone's Creek and George River south of Roebourne, 1878, *J. Forrest* (MEL 110234).

Distribution. Pilbara region (Fortescue Botanical District) of Western Australia.

I have not found a syntype that was collected by J. Forrest near Nickol Bay, however, there is a specimen (MEL 110235) labelled by Mueller *'Helipterum Margarethae*, Nickol River, A. Forrest' which is possibly the collection referred to by him since Alexander Forrest was with John Forrest on the expedition to the Nickol Bay area in 1878. This A. Forrest collection is of *Rhodanthe frenchii*. Mueller describes the leaves as *'amplexantibus'* and the involucral bracts as *'candida'*, that is, pure white, terms that apply to *R. margarethae* as lectotypified by the 'Jone's creek and George River' specimen, but not to the Nickol River collection.

The epithet *'margarethae'* honours Margaret Forrest (1845-1929), wife of John Forrest the explorer and statesman. Mueller evidently considered a preferred latinization of her name to be *'margaritae'* for he used this variant in 1882 and 1889 as did Otto Kuntze in 1891.

Rhodanthe frenchii (F. Muell.) Paul G. Wilson, comb. nov.

Helipterum frenchii F. Muell., S. Sci. Rec. 3:34(1883). Type citation: 'Near Menilayalya in the vicinity of Shark-Bay; J. Forrest' (holo: MEL 50293 'Head of Menilyalya R., 1882, *J. Forrest*').

[*Helipterum margarethae* F. Muell., Fragm. 11:48(1878) *pro parte* as to the Nickol River collection, not as to lectotype]

Distribution. Northern Carnarvon and north-west Ashburton Botanical districts of Western Australia.

10. Rhodanthe sect. **Anisolepis** (Steetz) Paul G. Wilson, comb. et stat. nov.

Anisolepis Steetz in Lehm., Pl.Preiss. 1:446(1845). *Type: Anisolepis pyrethrum* Steetz

Annual erect herb, glabrous or sparsely and minutely puberulous. Stem simple or branched above, towards the base thickened and aerenchymatous. Leaves cauline, simple, entire, alternate or the lower opposite, if submerged filiform, otherwise oblong and somewhat fleshy, c. 5 mm long, towards the apex becoming ovate and with scarious margins. Capitula homogamous, solitary and terminal to stem and branches. Involucre at first turbinate, becoming hemispherical with age, often subtended by the uppermost leaves; bracts 2-seriate, all radiant and with claws: claw erect, narrow-deltoid, c. 1 mm long, margin scarious, stercome prominent, narrow-oblong, thick and raised, sparsely glandular, limb

petaloid, radiating, white, elliptic, c. 5 mm long, eventually breaking away from the persistent claw. Receptacle narrow-conical, deeply foveolate, fimbrilliferous around foveolae. Florets numerous, bisexual. Corolla tube cylindrical, c. 1.5 mm long, sub-campanulate above, shortly 5-lobed; lobes triangular, abaxial surface with a few hairs that have large ovoid gland-cells at their tips, two of the lobes with adaxial surface papillose at base, the others glabrous, margins thickened; cells of inner epidermis of lobes irregularly oblong, of the neck oblong and undulate on margin. Anthers included; terminal appendage broad-oblong, obtuse, thin, cells oblong, thin-walled; tails weak and filamentous. Style tips rounded to acuminate; vascular strand extending to base of tip. Achene barrel-shaped, c. 1 mm long, dark reddish brown, pilose with fine hairs, not myxogenic; carpopodium very short, annular; pericarp very thinly crustaceous, pale brown; testa mauve, thinly coriaceous, vascular strands not apparent; crystals absent. Pappus c. 1 mm long of c. 10 narrowly triangular serrate scales united in lower half, tardily deciduous as a whole.

Rhodanthe pyrethrum (Steetz) Paul G. Wilson, comb. nov.

Anisolepis pyrethrum Steetz in Lehm., Pl. Preiss. 1:447(1845). - *Helipterum pyrethrum* (Steetz) Benth., Fl. Austral. 3:642(1867). - *Argyrocome pyrethrum* (Steetz) Kuntze, Revis. Gen. Pl. 1:309(1891). Type citation: 'In depressis uliginosis sylvae supra oppidulum Perth, d. 26.Sept.1839. Herb. Preiss. No.14.' *Lectotype* (here chosen): MEL 108293; *isolecto:* MEL 108294.

There is some variability within this species but it is unclear as to how much is due to growth conditions. Collections made to the north of Perth have the lower (underwater) leaves linear-acuminate and opposite, whereas collections made to the south of Perth have the underwater leaves filiform and scattered. There are also slight differences between different populations in the size of achenes, in the distribution of the globular glands, and in the branching of the inflorescence. However, all these characters show such variability over the total species range that specific or infraspecific discrimination does not appear practicable.

Rhodanthe pyrethrum is similar in some features to the species in *Rhodanthe* sect. *Achyroclinoides*, noticeably in the size and morphology of the achene. It differs from this section and from other sections of *Rhodanthe*, in the nature of the involucral bracts which are all radiant and which have claws that possess a very thick narrow-oblong stereome, in the laciniate scales of the pappus, and in the rounded to acuminate style apices.

11. Rhodanthe sect. **Polyphyllum** Paul G. Wilson, sect. nov.

Herba annua, modice lanosa, glandis sessilibus globosis sparse ornata. Folia numerosa, alterna, filiformia. Inflorescentium corymbosum. Capitula homogama, radiantia. Involucrum late turbinatum c. 5 mm altum; bracteae intermediae scariosae, sparse lanosae, stereomate anguste oblongo, crasso; bracteae intimae similis sed limbo albo ornato. Flores 8-12, bisexuales; corolla tubularis, sparse glanduloso puberula, lobis 5, brevibus, intra glabris, nervis ad apicem extensis. Antherum appendice late ovato, crasso, caudis collum aequantibus, crassis, ramosis. Styli apex truncati, nervo crasso sub-apice extenso. Achenium doleiforme, truncatum, modice hirtellum; carpopodium crassum; pericarpium crustaceum, rugosum; testa chartacea, libra, nervo 3/4 circumdato; nervis pericarpi et testae in posite laterali locatis. Pappus corollam acquans; setae filamentosae, breviter plumosae, caducae.

Typus: Rhodanthe polyphylla (F. Muell.) Paul G. Wilson

Annual erect herb, somewhat woolly and with scattered minute globular reddish brown glandular hairs, single stemmed. Leaves numerous, filiform. Inflorescence a terminal corymb. Capitula homogamous, shortly pedunculate, radiant. Involucre broadly turbinate c. 5 mm high; bracts c. 4-seriate; outer and intermediate bracts scarious, sparsely woolly with a thick narrow-oblong stereome; innermost bracts similar but with a short oblong white limb. Florets 8-12, bisexual; corolla narrow-tubular, slightly broader above, sparsely glandular puberulous; lobes 5 short, glabrous within, sparsely glandular puberulous outside, cells of inner epidermis narrow-oblong, vascular strands passing to apex of lobes. Anther appendage broad-ovate, thick, cells unevenly oblong; anther tails stout, branched, equal to collar. Style apex truncate, vascular strand thick and extending to just below apex. Achene barrel-shaped with a truncate apex, moderately hirtellous with slender duplex hairs; carpopodium thick; pericarp crustaceous, rough; testa papery, free from pericarp, vascular strand passing over apex of seed; vascular strands of pericarp and of testa in lateral position (in relation to cotyledons). Pappus equal to corolla; bristles filamentous, shortly plumose, shortly united at base, caducous.

Note. A number of features make this monotypic section unique in the *Helichrysum* complex; these are: 1) the numerous cauline, lanate, filiform leaves, 2) the short, stout, branched anther tails, and 3) the thick anther appendage with unevenly shaped oblong cells. Its position in relation to the other sections of *Rhodanthe* and to genera in the *Cassinia* complex is unclear. It is likely that this section should be recognised as a distinct genus.

Rhodanthe polyphylla (F.Muell.) Paul G. Wilson, comb. nov.

Helipterum polyphyllum F. Muell., Fragm. 1:35(1858). - *Argyrocome polyphylla* (F. Muell.) Kuntze, Revis. Gen. Pl. 1:309(1891). Type citation: 'In planitiebus basalticis a fluvio Brisbane usque ad montes Peak Range. - In tractu Kent's Plains. W. Hill.' *Lectotype* (here chosen): Brisbane River, Peak Range, *F. Mueller* (MEL 109740); *syntype:* Moreton Bay, Kents Plains, *anon.*(MEL 109757).

Distribution. Eastern Queensland and north-east New South Wales.

Cephalipterum A. Gray

Cephalipterum A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:271(1852). *Type: Cephalipterum drummondii* A. Gray

Annual erect herb, indumentum of curled filiform hairs septate at base with glandular stipitate hairs below capitula. Leaves cauline and basal, linear to obovate. Capitula heterogamous, very shortly pedunculate in dense terminal umbels. Involucre cup-shaped; bracts multiseriate, scarious, the innermost with a white or yellow lamina. Receptacle small, conical, glabrous. Florets numerous; 1-2 outer bisexual, remainder male. Corolla narrow-urceolate, shortly 5-lobed, glabrous, lobes smooth within; vascular strands terminating in tube. Anthers: appendix ovate with narrow-oblong cells; collar short and broadly expanded at base; tails weak; style apex truncate, somewhat broader than style branch, prominently papillose. Achene broadly compressed obovoid with a broad-circular apex that has a hard raised lip on the abaxial margin; sterile achenes hard, broad-obovoid, the apical surface vertical; attachment small, carpopodium absent; indumentum (fertile and sterile achenes) of dense white clavate helically coiled duplex hairs on abaxial surface, of woolly clawed simple hairs on adaxial surface; pericarp thick and hard; testa thinly coriaceous closely covered all over with broad-

oblong imbricate crystals; vascular strands of pericarp and testa medial in relation to the broad-obovate embryo. Pappus bristles free, caducous, linear to filiform, shortly plumose in upper half, the terminal cilia congested, thickened and recurved.

Cephalipterum drummondii A. Gray, *op.cit* 272. Type citation: 'Swan River, Drummond.' *n.v.*

Cephalipterum drummondii f. *major* Diels & Pritz., Bot. Jahrb. 35:615(1905) *nom.illeg.* (based on type *forma*).

Cephalipterum drummondii f. *minor* Diels & Pritz., *l.c.*

Type citation: 'hab. in distr. Coolgardie pr. Kanowna flor. m. Aug. (W.V. Fitzgerald in hb. Berl.); in distr. Austin pr. Murrinmurrin fl. m. Nov. (W.J. George).' *Neotype* (here chosen): Kanowna, August 1898, *W.V.Fitzgerald* (PERTH).

Note. The syntype material in herb. B is destroyed, I have therefore chosen as neotype a probable isosyntype in PERTH.

This genus is similar in many features to species in *Rhodanthe* sect. *Synachyrum*, in particular in possessing a dense imbricate crystalline cover to the seed. Only one or two seeds in the capitulum are fertile but these coalesce to the sterile achenes by means of a dense mass of barbed hairs on their adaxial surfaces which cause the entire cluster to be dispersed as one unit from which one seedling emerges with the sterile achenes forming a persistent ring around the base of the root. The fertile achenes bear at their tip a raised rim on their abaxial margin; this character is unique in the *Rhodanthe* complex.

A number of variants of this species occur which vary in the size and colour of the involucral bracts with sometimes two or more variants being present at the same locality. It is probable that the variants have edaphic preferences but speculation on this matter has still to be confirmed. Some of these variants may warrant recognition; Turner (1970) has recorded chromosome counts of n =12 and n = 14 for the species, however, the voucher material (PERTH) for the counts appears to be morphologically identical.

Erymophyllum Paul G. Wilson

Erymophyllum Paul G. Wilson, Nuytsia 7:105(1989).

Type: Erymophyllum gracile (A. Gray) Paul G. Wilson.

Pteropogon sect. *Helipteroides* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:269(1852). *Lectotype: Pteropogon gracilis* A. Gray (Wilson 1989b).

For list of species see Wilson 1989b.

The Hyalosperma group

Hyalosperma Steetz

Hyalosperma Steetz in Lehm., Pl. Preiss. 1:476(1845). *Lectotype: Hyalosperma glutinosum* Steetz (Wilson 1989a).

Helipterum sect. *Pachypterum* Steetz in Lehm., Pl. Preiss. 1:473(1845). *Lectotype: Helipterum cotula* (Benth.) DC. (Wilson 1989a).

Pteropogon sect. *Pteropogonopsis* A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:269(1852). *Type: Pteropogon demissus* A. Gray.

For description and list of species see Wilson 1989a.

Gilberta Turcz.

Gilberta Turcz., Bull. Soc. Nat. Mosc. 24/1:192 (pre 27 March 1851). *Type: Gilberta tenuifolia* Turcz.

Antheidosorus A. Gray, Hooker's J. Bot. Kew Gard. Misc. 3:98 (April 1851). *Type: Antheidosorus gracilis* A. Gray.

Erect annual, moderately arachnoid. Leaves alternate, filiform. Capitula heterogamous, terminal to short lateral branches, nutant in fruit. Involucre turbinate to hemispherical, c. 4 mm high, radiant; outer bracts very broadly ovate, hyaline, slightly woolly at base; intermediate bracts with a broad hyaline slightly woolly claw and a short spreading yellow limb; innermost bracts obovate, hyaline, pale yellow, not radiating; stereome of ray bracts short and triangular. Receptacle flat, covered with scarious narrow-oblong receptacular bracts of which c. 5 surround each floret. Florets actinomorphic, the outer row bisexual and the remainder male. Biscxual florets: Corolla glabrous, the vascular strands terminating at apex of throat; tube narrowly cylindrical; throat very short and turbinate; lobes 5, oblong, acute, prominent, smooth within, the cells narrow-oblong with straight walls. Anthers exserted; terminal appendage ovate, c. 0.2 mm long, cells narrow-oblong with thin walls; tails weak and filamentous. Style apex narrow-ovate to deltoid, densely papillose, the vascular strand slender and extending to base of apex. Achene compressed obovoid, c. 1.5 mm long, minutely colliculate; carpopodium minute (scarcely apparent); pericarp thick and transparent, strongly myxogenic; testa thinly coriaceous, brown, without crystals, vascular strands not apparent. Sterile achenes linear. Pappus of 5 unequal linear-acuminate shortly plumose bristles of which one or two have clavate terminal cilia; pappus of fertile florets weak and caducous as a whole, of male florets indurated at base and persistent on achene.

Gilberta tenuifolia Turcz., *op.cit.*193. *Type:* Western Australia, *J. Gilbert* 277 (holo: KW).

Antheidosorus gracilis A. Gray, Hooker's J. Bot. Kew Gard. Misc. 3:174 (June 1851). - *Myriocephalus gracilis* (A.Gray) Benth., Fl. Austral. 3:559(1867). *Type:* Swan river Colony, *J. Drummond, n.v.*

Helipterum verecundum S. Moore, J. Linn. Soc. 34:200(1899). Type citation: 'Juxta Coolgardie repperi mens. Aug. florentem', *S. Moore, n.v.*

Asa Gray (1851) suggested that, due to the presence of receptacular bracts, this species had affinities to *Myriocephalus*. However, as has been pointed out by Short *et al.* (1989), *Gilberta* has little in common with *M. appendiculatus* Benth., the type of *Myriocephalus*. The florets and achenes of *Gilberta tenuifolia* are, in fact, very similar to those of *Hyalosperma*, particularly to *H. glutinosum* (Steetz) Paul G. Wilson. Both of these species have a similar corolla with narrow-oblong cells in the inner epidermis of the lobes, almost identical anthers and style apices, a similar pappus, and very similar achenes in which the pericarp forms a pellucid myxogenic layer around the seed. The leaves and indumentum of *Gilberta* are also of the same form as those found in *Hyalosperma*. *Gilberta* differs most obviously in the arrangement of the capitula and in the presence of capitular bracts around each floret; it also has glabrous corolla lobes whereas in *H. glutinosum* the corolla lobes have hairs that possess a large ovoid terminal gland.

According to Warcup (1990) both *Gilberta* and *Hyalosperma* form an ectomycorrhizal association while four species currently placed in *Myriocephalus* that have been tested do not.

The two names, *Gilberta* and *Antheidosorus*, were evidently published within a few days of each other. A copy of the Bull. Soc. Imp. Naturalistes Moscou 24/1 was lodged with the Censor on 17 January 1851 (Old Style Calendar) and presented to the Society on 15 March 1851 (O.S.) which is equivalent to 27 March 1851 (New Style). I have taken the date on which it was presented to the Society as being the date of publication (see Stafleu 1969, Marchant 1989). According to Stafleu and Cowan (1979), p.98 of Hooker's J. Bot. Kew Gard. Misc. vol. 3 was published in April 1851 and p.174 in June 1851.

The spelling *Gilberta* (and not *Gilbertia*) was deliberately used by Turczaninow in order that it could be better distinguished from *Gilibertia* Ruiz & Pav., a genus in the Araliaceae.

The Triptilodiscus group

Triptilodiscus Turcz.

Triptilodiscus Turcz., Bull. Soc. Imp. Naturalistes Moscou 24/2:66(Aug.-Nov. 1851). *Type: T. pygmaeus* Turcz.

Dimorpholepis A. Gray in Hooker, Icon. Pl. 9:t.856(Sept.-Nov.1851); A. Gray, Hooker's J. Bot. Kew Gard. Misc. 4:227(Aug.1852). *Type: D. australis* A. Gray.

Duttonia F. Muell., Linnaea 25:409(1853). *Type: D. sessiliceps* F. Muell.

Annual herb with several major axes, sparsely pilose with slender hairs. Leaves alternate linear to narrow-oblong. Capitula heterogamous, terminating branches and subtended by c. 5 leaves of which one or more may bear a shoot that continues growth to give a monochasial conflorescence. Involucre subglobular c. 6 mm high, not radiant. Outer bracts scarious, hyaline, narrow-elliptic, ± equal to head, long-ciliate with linear stereome. Inner bracts narrow-oblong, slightly exceeding outer

bracts, cartilaginous and prominently thickened with narrow scarious shortly ciliate margin and scarious ciliate apex, somewhat boat-shaped, hispidulous abaxially. Receptacle broad-conical, smooth, glabrous. Florets discoid, a few outer female, remainder bisexual. Female florets: corolla very narrow-tubular 2-2.5 mm long, narrow-urceolate at apex, eventually curved outwards, very shortly 3-dentate, minutely and sparsely glandular puberulous with uniseriate hairs; inner cells of urceolate portion with sinuate margins, lobes densely papillose within; pappus a short corona of barbellate scales, sometimes with one shortly plumose bristle. Bisexual florets: corolla narrow-tubular, urceolate above, minutely 4-dentate, c. 2.5 mm long, at first erect eventually curved outwards, otherwise as in female florets; anther-appendage oblong, very thin, cells narrow-oblong, unthickened; anther tails filamentous, shorter than collar; style apex truncate; achene narrow-cylindrical, c. 1.8 mm long, minutely puberulous with 2-celled tooth-like hairs rounded at apex; pericarp diaphanous; testa leathery, smooth, without crystals; boss a minute narrow ring; pappus bristles 3-4, linear-acuminate, shortly plumose, c. 2.5 mm long, persistent,

Triptilodiscus pygmaeus Turcz., *l.c.* - *Helipterum pygmaeum* (Turcz.) Druce in Hayward & Druce, Advent. Fl. Tweedside 103(1919) *comb. illeg. Type:* Western Australia, *J. Drummond* 5th coll. n.54 (iso: MEL 109204).

Dimorpholepis australis A. Gray, *l.c.* - *Helipterum dimorpholepis* Benth., Fl. Austral. 3:650(1867) *nom. illeg.* - *Argyrocome dimorpholepis* Kuntze, Revis. Gen. Pl. 1:309(1891). - *Helipterum australe* (A. Gray) Druce, Bot. Exch. Club Brit. Isles 1916, 4:627(1917). Type citation: 'Hab. South-western Australia, Drummond. Also in the interior of Eastern Australia, at Bathurst Plains, Fraser; and Nangers, Captain M'Arthur.' *Syntype: J. Drummond* 54 (K, photo seen).

Duttonia sessiliceps F. Muell., Linnaea 25:410(1853). Type citation: 'In pratis prope rivum Rocky-creek.' *Lectotype* (here chosen): Rocky Creek, Oct. 1851, *F. Mueller* (lecto: MEL 109152; isolecto: MEL 109197).

There is uncertainty over the publication dates of *Triptilodiscus* Turcz. and *Dimorpholepis* A. Gray. The former name was published in the Bull. Soc. Imp. Naturalistes Moscou vol.24 part 2 no. 3 which was sent to the Censor on 15 August 1851 and presented to the Society on 5 November 1851 (New Style calendar). The latter name was published as tab. 856 of the Icones Plantarum which appeared between September and November 1851 or possibly later, *fide* C. Jeffrey *in litt.* I have adopted the Turczaninow name, as did Laurie Haegi (1986), since there is the greater likelihood of it having priority.

This genus is closely related to *Haegiela* which shares the same branching habit of the conflorescence, as well as the same hair type, and similar corolla and achene characters. *Haegiela* differs principally in the absence of a pappus, the presence of crystals in the testa, and the presence of unthickened inner involucral bracts.

Haegiela P. Short & Paul G. Wilson

Haegiela P. Short & Paul G. Wilson, Muelleria 7:259(1990). *Type: Haegiela tatei* (F. Muell.) P. Short & Paul G. Wilson

For description and discussion see Short & Wilson, *op.cit.*

Pterochaeta Steetz

Pterochaeta Steetz in Lehm., Pl. Preiss. 1:456(1845). Type: *Pterochaeta paniculata* Steetz

Annual woolly herb with one to several major axes. Leaves alternate, oblong. Capitula homogamous, shortly pedunculate, racemosely arranged, subtended by two leafy bracts. Involucre broad urceolate; bracts multiseriate, long ciliate, woolly, pale yellow; outer bracts ovate, scarious, attenuate at base with a minute hard green stereome, shortly apiculate with a pale fawn lamina; intermediate bracts broad-ovate scarious with a narrow-oblong hard claw (stereome) and a short oblong lamina; innermost bracts very short on a narrow-oblong hard naviculiform claw; receptacle naked; florets c. 20, outer female, inner bisexual, actinomorphic. Corolla cylindrical, shortly 4-lobed in female, 5-lobed in bisexual, glabrous; lobes glabrous within, thickened on margin; cells of throat undulate. Anther c. 0.7 mm long, delicate, appendage short, thin; tails filamentous. Style apex truncate. Achene narrow-ellipsoid, shortly beaked, covered with 2-celled tooth-like papillae; pericarp thin and weak, transparent, myxogenic, vascular strands laterally placed in relation to the cotyledons; testa leathery, brown rugulose, cells very thick walled and deeply undulate with scattered narrow-oblong crystals, vascular strand laterally placed and confined to near base of seed; carpopodium minute, annular. Pappus equal to corolla; bristles plumose, persistent.

One species endemic to southern Western Australia.

Pterochaeta paniculata Steetz in Lehm., *op.cit.* 455. - *Waitzia paniculata* (Steetz) Benth., Fl. Austral. 3:637(1867). *Lectotype* (here chosen): In limoso-arenosis planitiei haud longe a praedio rustico "Maddington", et sinu regis Georgii III., Nov.[18]39 et [18]40. *L. Preiss.* No.35. (lecto: MEL 1585199; isolecto: LD).

The genus *Waitzia* differs from *Pterochaeta* most obviously in habit, in the nature of the anther apiculum and anther tails, in having a stout deltoid style apex with a vascular strand extending to the tip, and in the form of the achene. The vascular strands of the pericarp in *Waitzia* are medially placed in relation to the cotyledons whereas in *Pterochaeta* they are laterally placed.

Haptotrichion Paul G. Wilson, gen. nov.

Herba annua erecta pilis septatis glandulosis pubescens. Folia caulina alterna lincaria. Capitula homogama, solitaria radiantia. Involucrum hemisphericum; bracteae c. 4-seriatae; bracteae exteriores elliptica hyalina longe ciliata, stereomate anguste oblongo plano; bracteae intimae ungue anguste elliptico longe ciliato, stereomate anguste oblongo, lamina elliptica flava. Receptaculum minute glanduloso papillosum. Flosculi numerosi, bisexuales, actinomorphi. Corolla tubo gracili glanduloso piloso, limbo campanulato glabro; lobi 5, ovati, nervis ad apicem extensis. Antherae: appendix ovatus tenuis, cellulis marginalibus manifeste discretis, cellulis basalibus ± equilateralibus, cetera anguste oblongis; caudae filamentosae collum superantes. Styli apex truncatus. Achenium angusto ellipticum compressum, ad apicem in rostro productum, papillis 2-cellulis dentoideis ornatis; pericarpium: stratum exterius cellulis cubicis parietibus tenuibus; stratum interius cellulis incrassatis, lignosis, sclerenchymatis; testa tenuissima, nervo circumnexo. Pappus persistens, setis filiformibus, denticulatis, basi versus in tubo conjunctis.

Typus: Haptotrichion conicum (B. Turner) Paul G. Wilson

Annual erect herbs pubescent with gland-tipped septate hairs. Leaves cauline, alternate, linear. Capitula solitary and terminal to long branches, radiant. Involucre hemispherical; bracts c. 4-seriate; outer bracts elliptic, hyaline, long-ciliate with a brown narrow-oblong flat stereome; innermost bracts with a narrow-elliptic hyaline long-ciliate claw, a narrow-oblong stereome, and a yellow elliptic lamina. Receptacle minutely glandular papillose. Florets numerous, bisexual, actinomorphic. Corolla: tube slender, glandular pilose; limb campanulate, glabrous; lobes five, ovate, vascular strands extending to tips. Anther; appendage ovate, thin, marginal cells differentiated, basal cells ± equilateral, medial and distal cells narrow-oblong; tails slender delicate, extending to beyond collar. Style apex truncate; vascular strand prominent, extending almost to tip. Achene narrow-elliptic, compressed, extending into a terminal beak, minutely papillose with 2-celled tooth-like trichomes; carpopodium annular, short; pericarp: outer layer of 1-cell thick layer of thin-walled cubical cells; inner layer of 2-3 rows of thick walled sclerenchymatous cells; testa extremely thin, more or less adherent to pericarp; endosperm thin, free from testa; vascular strands of pericarp lateral (in relation to cotyledons); vascular strand of testa passing almost completely around seed in lateral position. Pappus bristles filiform, barbellate, united below to form a cup-shaped base, entire or slit on one side, persistent.

Haptotrichion conicum had been placed in *Waitzia* since it possessed beaked achenes. It differs from *Waitzia* most obviously in 1) having a different type of indumentum (not cottony), 2) having broad flat hyaline claws to the inner involucral bracts (not terete and firm), 3) in having truncate style apices (neither ellipsoid nor deltoid), and 4) in having delicate filamentous anther tails (not slender and firm). *Haptotrichion* further differs from *Waitzia* in the anatomy of the achene for its pericarp has an outer single-celled layer of thin-walled cube like cells and an inner layer of several rows of thick-walled sclerenchymatous cells, while the testa is extremely thin and delicate. In *Waitzia* the pericarp consists of a thin layer of hyaline linear cells while the testa is thick, rugose, and made up of thick-walled collenchyma. The vascular strand in the testa of *Haptotrichion* passes almost completely around the seed but in *Waitzia* it is confined to the base.

From *Pterochaeta* this genus differs in the manner of branching of the stem and inflorescence (*q.v.*), in the nature of the involucral bracts, the nature of the corolla, and the nature of the anther apiculum. In *Pterochaeta*, *Haptotrichion* and *Waitzia* the achenes are beaked and bear tooth-like 2-celled trichomes but in other characters the genera are very distinct.

The genus consists of two species, both endemic to the Carnarvon District (Beard 1980) of Western Australia.

Haptotrichion colwillii Paul G. Wilson, sp. nov. (Figure 6)

Herba erecta ad 25 cm alta. Rami glanduloso puberuli sub capitula pilosi. Folia linearia, 8-15 mm longa, glanduloso puberula. Involucrum hemisphaericum, c. 10 mm altum et latum; bracteis exterioribus late ellipticis, hyalinis, ciliatis; bracteis intimis ungue anguste elliptico, c. 9 mm longo, hyalino, ciliato, limbo anguste obovato obtuso, 9-15 mm longo, luteo. Corolla c. 5 mm longa, tubo glanduloso hirtello, limbo anguste turbinato, glabro, intra sub lobis papilloso. Achenium anguste ellipsoideum c. 2.5 mm longum, denticulatum; rostrum gracile, laeve, ad 3 mm longum. Pappus persistens, setis in basi connatis, tubiformibus.

Typus: 7 km S of Overlander Roadhouse [c. 170 km S of Carnarvon], Western Australia, 1 Sept. 1985, *H. Demarz* 10702 (holo: PERTH).

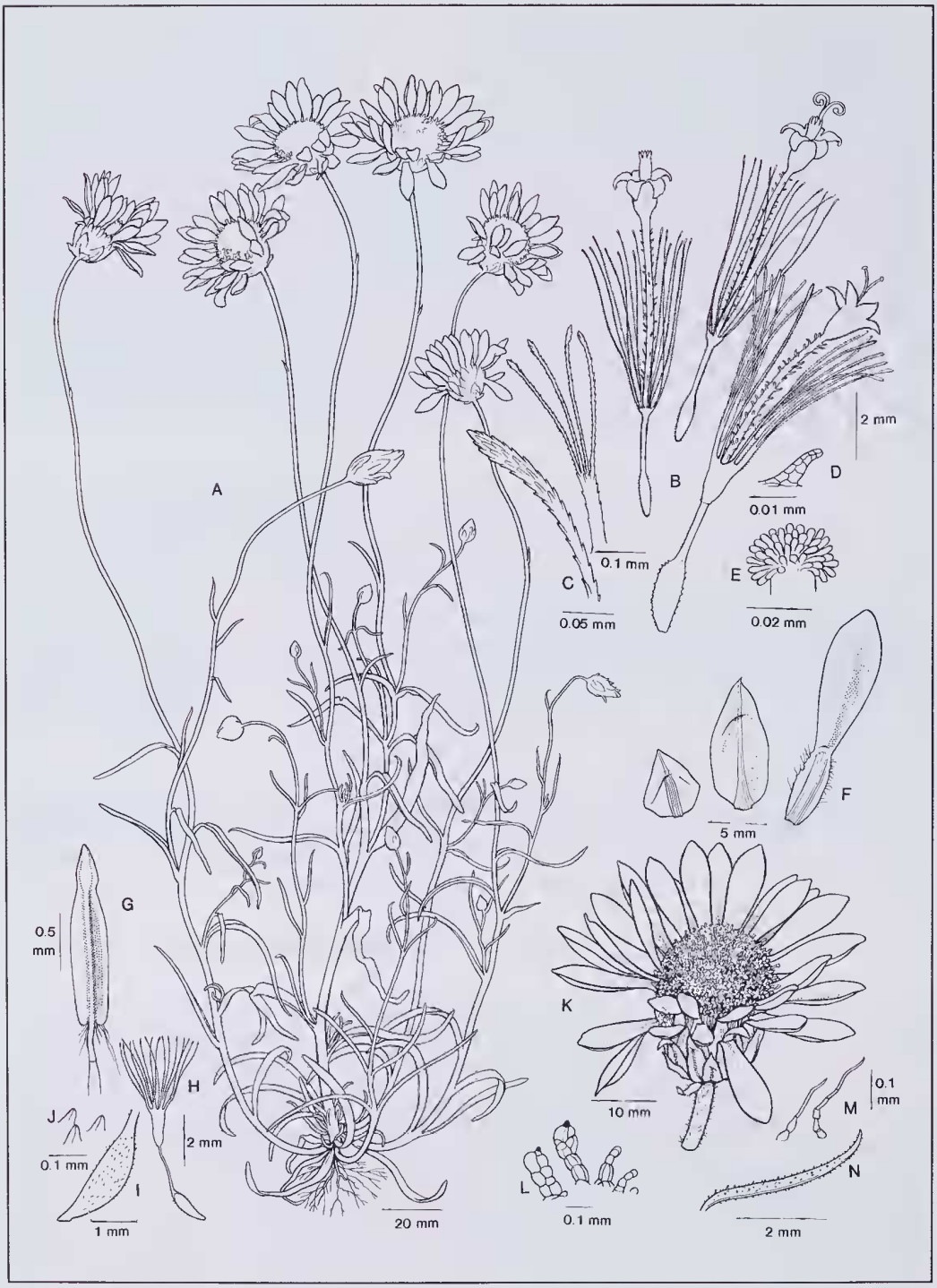

Figure 6. *Haptotrichion colwillii*. A - Habit. B - Florets. C - Pappus bristle apices. D - Hair of corolla. E - Style apex. F - Outer, intermediate, and inner involucral bracts. G - Anther. H - Achene with pappus. I - Achene. J - Achene papillae. K - Capitulum. L & M - Hairs of stem. N - Leaf. From *H. Demarz* 10702.

Erect herb to 25 cm high, branching at base. Principal axes slender, to 20 cm high, simple or sparsely branched, glandular puberulous, pilose beneath capitulum. Leaves linear, 8-15 mm long, c. 0.7 mm wide, glandular puberulous, margins slightly recurved. Involucre hemispherical, c. 10 mm high and wide. Outer bracts broad-elliptic, hyaline, ciliate; stereome narrow-triangular, brown, glandular puberulous. Innermost bracts: claw narrow-elliptic, c. 9 mm long, hyaline, ciliate, stereome very narrow-oblong, glabrous except for the glandular puberulous apex; limb narrow-obovate, obtuse, 9-15 mm long, yellow. Corolla c. 5 mm long; tube narrow, glandular hirtellous with multicelled hairs; limb narrow-turbinate, glabrous, shortly 5-lobed, papillose within below junction of lobes. Achene compressed narrow-ellipsoid, c. 2.5 mm long, barbellate with 2-celled papillae; beak slender, smooth, to 3 mm long. Pappus more or less equal to corolla, persistent, bristles united towards base to form a tube c. 2 mm long.

Additional specimen examined. WESTERN AUSTRALIA: Hamelin Pool, 16 Sept. 1984, *J. Colwill s.n.* (PERTH).

Habitat. Found on red sand over limestone (*fide* H. Demarz *in sched.*).

Distribution. Only known from near Hamelin Pool, c. 170 km south of Carnarvon, Western Australia.

Notes. Haptotrichion colwillii is very similar to *H. conicum* which is known from an area between Carnarvon and Gascoyne Junction. The latter species differs most obviously in 1) the leaves ending in a rounded 'capitate' tip, 2) the receptacle being narrow-conical (not rounded), and 3) the pappus sheath being split along one side.

Haptotrichion colwillii is named after John Colwill, a Western Australian horticulturalist who has a particular interest in the native Asteraceae and who first collected this species.

The illustration is drawn from a plant raised from seed collected by Herbert Demarz and grown at Kings Park Botanic Garden, Perth. I should like to thank the staff of Kings Park for their unstinted assistance in my study of this and other annual species of the *Rhodanthe* complex.

Haptotrichion conicum (B. Turner) Paul G. Wilson, comb. nov.

Waitzia conica B. Turner, Sida 2:428(1966). *Type:* 11 miles west of Gascoyne Junction, 24 Aug. 1965, *B.L. Turner* 5405 (holo: MEL 598263; iso: MEL 598265, PERTH).

[*Waitzia podolepis* auct. non (Gaud.) Benth.: F. Muell., Zeitschrift des allgem. österreich. Apothcker-Vereines 34 (no.36):933-936 (1896); F. Muell., Pl. Indig. Sharks Bay 16(1883).]

Distribution. Between Carnarvon and Gascoyne Junction, Western Australia.

A description of this species was provided by Mueller (1883) based on a collection made by J. Polak (or Pollack) in 1882 from the Gascoyne River region (MEL 1584941). Mueller assumed that the plant he was describing was *Waitzia podolepis* (Gaudich.) Benth.: 'this plant represents evidently the genuine species, illustrated by Gaudichaud', even though Mueller had seen no authentic material of that species. In 1896 Mueller again included the Pollack specimen under *W. podolepis* but without comment. In 1905 Diels and Pritzel stated that the Pollack collection was not *W. podolepis*, however, they did not give it a name.

Acknowledgements

I thank the various Australian herbaria who sent on loan much of their material of *Helipterum* for study. Kings Park Botanic Garden allowed me to have access to their live collection and provided me with seed of a number of species. Steve Hopper kindly searched for and collected from different populations of rare *Rhodanthe* species near Shark Bay. Photographs of relevant Asteraceae types in herb. KW were made available to me by my colleague Neville Marchant. Discussions and correspondence with Philip Short and Arne Anderberg have been stimulating and of considerable assistance. The drawings were prepared with much care by Margaret Menadue.

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Index to Scientific Names

New names are given **bold** type. Other accepted names are in roman. Synonyms are in *italics*.

Name changes in Australian species of *Helipterum* (see also Wilson 1989a,b and 1992a,b)

Taxa listed in Hnatiuk (1990)	**Taxa accepted by Wilson**
H. adpressum	Chrysocephalum puteale (S. Moore) Wilson
H. albicans	Leucochrysum albicans (A.Cunn.) Wilson
H. albicans subsp. *albicans*	Leucochrysum albicans subsp. albicans
H. albicans var. *buffaloensis*	Leucochrysum albicans var. buffaloensis (Wilson) Wilson
H. albicans var. *incanum*	Leucochrysum albicans subsp. albicans var. tricolor (DC.) Wilson
H. albicans subsp. *alpinum*	Leucochrysum albicans subsp. alpinum (F. Muell.) Wilson
H. albicans var. *graminifolium*	Leucochrysum graminifolium (Wilson) Wilson
H. anthemoides	Rhodanthe (Leiochrysum) anthemoides (Sprengel) Wilson
H. australe	Triptilodiscus pygmaeus Turcz.
H. battii	Rhodanthe (Helichrysoides) battii (F. Muell.) Wilson
H. charsleyae	Rhodanthe (Helichrysoides) charsleyae (F. Muell.) Wilson
H. chlorocephalum	Rhodanthe (Leiochrysum) chlorocephala (Turcz.) Wilson subsp. chlorocephala
H. condensatum	Rhodanthe (Achyroclinoides) condensata (F. Muell.) Wilson
H. corymbiflorum	Rhodanthe (Leiochrysum) corymbiflora (Schldl.) Wilson
H. corymbosum	Rhodanthe (Achyroclinoides) corymbosa (A. Gray) Wilson
H. cotula	Hyalosperma cotula (Benth.) Wilson
H. craspedioides	Possibly referrable to Polycalymma
H. demissum	Hyalosperma demissum (A. Gray) Wilson
H. diffusum	Rhodanthe (Leiochrysum) diffusa (Cunn. ex DC.) Wilson var. diffusa
H. fitzgibbonii	Leucochrysum fitzgibbonii (F. Muell.) Wilson

H. floribundum	Rhodanthe (Synachyrum) floribunda (DC.) Wilson
H. forrestii	Rhodanthe (Achyroclinoides) forrestii (F. Muell.) Wilson
H. frenchii	Rhodanthe (Actinaria) frenchii (F. Muell.) Wilson
H. fuscescens	Rhodanthe (Leiochrysum) fuscescens (Turcz.) Wilson
H. gracile	Erymophyllum tenellum (Turcz.) Wilson
H. haigii	Rhodanthe (Achyroclinoides) haigii (F. Muell.) Wilson
H. heteranthum	Rhodanthe (Helipteridium) heterantha (Turcz.) Wilson
H. humboldtianum	Rhodanthe (Leiochrysum) humboldtiana (Gaudich.) Wilson
H. hyalospermum	Hyalosperma glutinosum Steetz subsp. glutinosum
H. involucratum	Erymophyllum ramosum (A. Gray) Wilson subsp. involucratum (F. Muell.) Wilson
H. jessenii	Hyalosperma semisterile (F. Muell.) Wilson
H. laeve	Rhodanthe (Achyroclinoides) laevis (A. Gray) Wilson
H. manglesii	Rhodanthe (Rhodanthe) manglesii Lindley
H. margarethae	Rhodanthe (Actinaria) margarethae (F. Muell.) Wilson
H. maryonii	Rhodanthe (Monencyanthes) maryonii (S. Moore) Wilson
H. microglossum	Rhodanthe (Leiochrysum) microglossa (Maiden & Betche) Wilson
H. molle	Leucochrysum molle (Cunn. ex DC.) Wilson
H. moschatum	Rhodanthe (Monencyanthes) moschata (Cunn. ex DC.) Wilson
H. niveum	Distinct genus; affinities with Helichrysum obtusifolium Sond.
H. oppositifolium	Rhodanthe (Leiochrysum) oppositifolia (S. Moore) Wilson
H. polycephalum	Rhodanthe (Achyroclinoides) polycephala (A. Gray) Wilson
H. polygalifolium	Rhodanthe (Leiochrysum) polygalifolia (Cunn. ex DC.) Wilson
H. polyphyllum	Rhodanthe (Polyphyllum) polyphylla (F. Muell.) Wilson
H. praecox	Hyalosperma praecox (F. Muell.) Wilson
H. propinquum	Rhodanthe ((Leiochrysum) propinqua (W. Fitzg.) Wilson
H. pterochaetum	Chrysocephalum ptcrochaetum F. Muell.
H. pygmaeum	Rhodanthe (Leiochrysum) pygmaea (DC.) Wilson
H. pyrethrum	Rhodanthc (Anisolepis) pyrethrum (Steetz) Wilson
H. roseum	Rhodanthe (Leiochrysum) chlorocephala subsp. rosea (Hook.) Wilson

H. rubellum	Rhodanthe (Leiochrysum) rubella (A. Gray) Wilson
H. saxatile	Distinct genus
H. semisterile	Hyalosperma semisterile (F. Muell.) Wilson
H. spicatum	Rhodanthe (Helichrysoides) spicata (Steetz) Wilson
H. splendidum	Rhodanthe (Leiochrysum) chlorocephala subsp. splendida (Hemsley) Wilson
H. sterilescens	Rhodanthe (Synachyrum) sterilescens (F. Muell.) Wilson
H. stipitatum	Leucochrysum stipitatum (F. Muell.) Wilson
H. stoveae	Hyalosperma stoveae (D.A. Cooke) Wilson
H. strictum	Rhodanthe (Leiochrysum) stricta (Lindley) Wilson
H. stuartianum	Rhodanthe (Synachyrum) stuartiana (Sond.) Wilson
H. tenellum	Erymophyllum tenellum (Turcz.) Wilson
H. tietkensii	Rhodanthe (Achyroclinoides) tietkensii (F. Muell.) Wilson
H. troedelii	Rhodanthe (Synachyrum) troedelii (F. Muell.) Wilson
H. uniflorum	Rhodanthe (Monencyanthes) uniflora (J. Black) Wilson
H. venustum	Hyalosperma glutinosum Steetz subsp. venustum (S.Moore) Wilson
H. zacchaeus	Hyalosperma zacchaeus (S. Moore) Wilson